

Data Evaluation Record on the Acute Toxicity of GF-2726 (2,4-D Choline Salt + Glyphosate DMA) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 49903201

Data Requirement:	PMRA Data Code: 9.8.4 (TGAI) or 9.8.6 (EP)
	EPA DP Barcode:
	OECD Data Point: IIA 8.12 (TGAI) and IIIA 10.8.1.1 (EP)
	EPA Guideline: 850.4100

Test material: 2,4-D Choline Salt **Purity:** 24.1%
 Glyphosate Dimethylammonium **Purity:** 21.7%

Common name:

Chemical name: IUPAC:

CAS name:

CAS No.

Synonyms: GE-2726 TSN306327

Primary Reviewer: Teresa Nelis
Senior Scientist, CDM Smith

Signature: *Teresa Nels*

Date: 6/8/16

Secondary Reviewer: Teri S. Myers
Senior Scientist, CDM Smith

Signature: Jen's Mom

Date: 6/13/16

Primary Reviewer: Edward Odenkirchen, Ph.D./EPA
EPA/OPP/EEED

Date: 08/01/2016

Secondary Reviewer(s): Kristina Garber/EPA
EPA/OPP/EEFD

Date: 8/11/2016 

Reference/Submission No.: {.....}

Company Code {.....} [For PMRA]
Active Code {.....} [For PMRA]
Use Site Category: {.....} [For PMRA]
EPA PC Code: 051505 (2,4-D Choline Salt)
103608 (Glyphosate DMA)

Date Evaluation Completed: 08/12/2016

CITATION: Bergfield, A. 2016. GF-2726 (2,4-D Choline Salt, 286 g a.s/L; Glyphosate Dimethylammonium 260 g a.s./L; SL): Effects on the Seedling Emergence and Growth of Non-Target Terrestrial Plants (Tier II). Unpublished study performed by ABC Laboratories, Columbia, Missouri, and sponsored by Dow AgroSciences LLC, Indianapolis, Indiana. ABC Study No. 83625; Dow AgroSciences Study No. 160304. Study completed April 27, 2016.

DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the acute toxicity of a pesticide to terrestrial vascular plants. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.

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EXECUTIVE SUMMARY:

The effect of **GF-2726 (2,4-D Choline Salt + Glyphosate Dimethylammonium)** on the seedling emergence of monocot (*Corn, Zea mays*; *Oat, Avena sativa*; *Onion, Allium cepa*; *Sorghum, Sorghum bicolor*; and *Wheat, Triticum aestivum*) and dicot (*Buckwheat, Fagopyrum esculentum*; *Cabbage, Brassica oleracea*; *Cucumber, Cucumis sativus*; *Mustard, Sinapis alba*; *Oilseed rape, Brassica napus*; *Radish, Raphanus sativus*; *Soybean, Glycine max*; *Sunflower, Helianthus annuus*; and *Tomato, Lycopersicon esculentum*) crops was studied. Nominal concentrations for all species were 0 (negative control), 0.00138, 0.0027, 0.0055, 0.0110, 0.0221, 0.044, 0.088, 0.176, 0.35, 0.71, and 1.41 lb 2,4-D Choline Salt/A, and were 0 (negative control), 0.00124, 0.0025, 0.0050, 0.0099, 0.0199, 0.040, 0.079, 0.159, 0.32, 0.64, and 1.27 lb Glyphosate DMA/A. Measured concentrations, used in analyses for the three highest treatment levels, for cabbage, cucumber, mustard, oilseed rape, onion, radish and tomato were 0.36, 0.72, and 1.41 lb 2,4-D Choline Salt/A; and for the five highest treatment levels for buckwheat, corn, oat, sorghum, soybean, sunflower and wheat were 0.083, 0.179, 0.35, 0.70, and 1.41 lb 2,4-D Choline Salt/A. Glyphosate DMA concentrations were not confirmed analytically.

The growth medium used in the seedling emergence test was a top soil silica sand mix (sandy loam, pH 6.4, organic carbon 1.5%). On day 21 the surviving plants per pot were recorded and cut at soil level for measuring the plant height and dry weight.

Seedling emergence in the negative control ranged from 86 to 100%. Significant inhibitions in emergence compared to the negative control were observed in cabbage, mustard, onion, radish, and tomato. Significant inhibitions in cabbage emergence of 41 and 41% (Dunnett's test, p<0.05), in mustard of 23 and 36%, and in radish of 21 and 45% were found at the 0.72 and 1.41 lb 2,4-D Choline Salt/A treatment level, respectively (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in onion emergence of 22% (Jonckheere-Terpstra Step-Down, p<0.05), and tomato of 25% were observed at the highest concentration only, 1.41 lb 2,4-D Choline Salt/A (Mann-Whitney U Two-Sample test, p<0.05).

Seedling survival was based on the number planted, and survival in the negative control ranged from 86 to 100%. The reviewer found significant inhibitions in survival for cabbage, mustard, onion, radish and tomato compared to the negative control. Significant inhibitions in survival were 41 and 41% in cabbage (Dunnett's test, p<0.05), 23 and 41% in mustard (Mann-Whitney U Two-Sample test, p<0.05), 19 and 39% in onion, and 21 and 47% in radish, at the 0.72 and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in tomato survival of 25% were observed at the highest concentration only, 1.41 lb 2,4-D Choline Salt/A (Mann-Whitney U Two-Sample test, p<0.05).

The reviewer additionally conducted comparisons and nonlinear regression analysis excluding the treatment levels where survival was negatively impacted for any species. The analysis revealed that survival effects occurred at similar levels as growth effects, making it difficult to parse out treatment-related effects between these two endpoints. However, because of the confounding effects of the high levels of survival resulting in estimates of extremely shallow dose-response curves, the low-dose extrapolations to low probability survival estimates produce absurdly conservative survival EC₀₅ estimates. Consequently, selection of most sensitive effects endpoint/species combinations were based on comparisons of biomass and height endpoints across all species considering either complete data sets or in the case of survival confounded species, truncated data sets as discussed above.

Significant inhibitions in seedling height compared to the negative control were observed in all species except corn, cucumber, sorghum, soybean, sunflower, and wheat. Significant inhibitions in cabbage height were 30, 52, and 65%, and in mustard height were 15, 50, and 65%, at the 0.36, 0.72, and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in oilseed rape height were 17 and 22%, and in onion height were 27 and 43%, at the 0.72 and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions were observed at the highest concentration tested only, 1.41 lb 2,4-D Choline Salt/A, in buckwheat (15%, Dunnett's test, p<0.05), oat (15%,

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Mann-Whitney U Two-Sample test, p<0.05), radish (27%, Dunnett's test, p<0.05), and tomato (26%, Jonckheere-Terpstra Step-Down test, p<0.05).

Significant inhibitions in seedling dry weight were found in cabbage, mustard, oilseed rape, onion, radish, and tomato compared to the negative control. Significant inhibitions in radish dry weight were 7 to 60% from the 0.088 to the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in cabbage dry weight were 50, 72 and 83%, in mustard dry weight were 19, 58 and 71%, and in oilseed rape dry weight were 16, 34 and 43% at the 0.36, 0.72 and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in dry weight were observed at the highest concentration tested only, 1.41 lb 2,4-D Choline Salt/A, in onion (47%, Jonckheere-Terpstra Step-Down test, p<0.05) and tomato (46%, Dunnett's test, p<0.05).

The most sensitive monocot was onion based on survival with NOAEC and EC₂₅ values of 0.36 and 0.0832 lb 2,4-D Choline Salt/A, respectively. The most sensitive dicot was cabbage based on survival with NOAEC and EC₂₅ values of 0.36 and 0.0469 lb 2,4-D Choline Salt/A, respectively.

There were none to slight phytotoxic effects (≤ 30) in all species except cabbage and mustard; moderate effects (40-60) were observed in cabbage and mustard. Phytotoxic effects were dose-related in cabbage, corn, cucumber, mustard, onion, radish, sorghum, and tomato.

Results Synopsis

Toxicity endpoints expressed as 2,4-D Choline Salt

Monocot

Most sensitive monocot: Onion based on survival*

EC ₅₀ /IC ₅₀ : 98.3 lb ai/A	95% C.I.: 4.78-15400000 lb ai/A
EC ₂₅ /IC ₂₅ : 0.0832 lb ai/A	95% C.I.: 0.0186-0.587 lb ai/A
EC ₀₅ /IC ₀₅ : 0.0000031 lb ai/A	95% C.I.: N/A-0.000151 lb ai/A
NOEC: 0.36 lb ai/A	
Slope: 0.22	95% C.I.: 0.0852-0.354

Most sensitive monocot: Onion based on biomass (Preferred)

EC ₅₀ /IC ₅₀ : 0.404 lb ai/A	95% C.I.: N/A
EC ₂₅ /IC ₂₅ : 0.372 lb ai/A	95% C.I.: 0.333-0.397 lb ai/A
EC ₀₅ /IC ₀₅ : 0.33 lb ai/A	95% C.I.: N/A-0.357 lb ai/A
NOEC: 0.36 lb ai/A	
Slope: N/A	

* Studies are designed to capture sub-lethal effects, therefore, survival is not expected to be the most sensitive endpoint.

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Dicot

Most sensitive dicot: Cabbage; based on survival*

EC ₅₀ /IC ₅₀ : 33.8 lb ai/A	95% C.I.: 1.57-1E10 lb ai/A
EC ₂₅ /IC ₂₅ : 0.0469 lb ai/A	95% C.I.: 0.00246-0.513 lb ai/A
EC ₀₅ /IC ₀₅ : 0.0000036 lb ai/A	95% C.I.: N/A-0.000295 lb ai/A
NOEC: 0.36 lb ai/A	
Slope: 0.236	95% C.I.: 0.0536-0.418

Most sensitive dicot: Cabbage; based on biomass (Preferred)

EC ₅₀ /IC ₅₀ : 0.274 lb ai/A	95% C.I.: 0.201-0.373 lb ai/A
EC ₂₅ /IC ₂₅ : 0.122 lb ai/A	95% C.I.: 0.0713-0.183 lb ai/A
EC ₀₅ /IC ₀₅ : 0.0381 lb ai/A	95% C.I.: N/A-0.007445 lb ai/A
NOEC: 0.0176 lb ai/A	
Slope: N/A	

* Studies are designed to capture sub-lethal effects, therefore, survival is not expected to be the most sensitive endpoint.

Table 1 (Tier II studies). Summary of most sensitive parameters by species (lb 2,4-D Choline Salt/A).

Species	Endpoint	NOEC	EC ₀₅ /IC ₀₅	EC ₂₅ /IC ₂₅	EC ₅₀ /IC ₅₀
Buckwheat*	Height	0.70	0.416	4.59*	NC
Cabbage*# ^a	Survival	0.36	0.0000036	0.0469	33.8*
Cabbage	Biomass (preferred) ^c	0.176	0.0381	0.122	0,274
Corn	None	1.41	NC	NC	NC
Cucumber	None	1.41	1.34	>1.41	>1.41
Mustard	Dry weight	0.176	0.0207	0.232	1.25
Oat*	Height	0.70	0.673	2.48*	6.1*
Oilseed rape*	Dry weight	0.176	0.0713	0.611	6.95*
Onion*# ^a	Survival	0.36	0.0000031	0.0832	98.3*
Onion	Biomass (preferred) ^c	0.36	0.33	0.372	0.404
Radish* ^a	Survival	0.36	0.0276	0.508	3.85*
Sorghum	None	1.41	NC	NC	NC
Soybean	None	1.41	NC	NC	NC
Sunflower	None	1.41	NC	NC	NC
Tomato# ^b	Dry weight	0.72	0.382	NC	NC
Wheat	None	1.41	NC	NC	NC

*Endpoints and/or confidence intervals are outside tested range of concentrations and should be interpreted with caution.

Jonckheere-Terpstra Step-Down test run for trends analysis; CETIS was unable to run the Williams test on more than 10 treatment levels.

^aStudies are designed to capture sub-lethal effects, therefore survival is not expected to be the most sensitive endpoint. The low survival may have confounded growth effects.

^bInhibition in any endpoint did not exceed 25% in this study. Dry weight was the only endpoint with a calculable IC₅ value.

^cThe confounding factor of high level of mortality at the highest two treatments yields highly uncertain low-dose extrapolated endpoints. Eliminating high dose survival effects yields more confident sublethal endpoints.

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This study is scientifically sound and is classified as acceptable.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED:

This study was conducted in compliance with OCSPP Guideline 850.4100: Seedling Emergence and Seedling Growth (January 2012). The reviewer evaluated the study methods according to EPA Ecological Effects Test Guidelines, OCSPP Guideline 850.4100: Seedling Emergence and Seedling Growth. There were some deficiency and deviations noted by the reviewer.

1. Survival was the most sensitive endpoint for cabbage, onion and radish. Onion and cabbage were also the most sensitive monocot and dicot based on survival. Studies are designed to capture sub-lethal effects, therefore survival is not expected to be the most sensitive endpoint. Inhibitions in survival may have impacted the validity of the other endpoints for cabbage, onion and radish. (*Note: To account for this deficiency additional analyses were performed for these species, eliminating the confounding survival-impaired treatment groups from statistical analyses for sublethal endpoints. These result produced more confident sublethal endpoint estimates and serve as the basis for across species sensitivity comparisons.*)
 1. The physico-chemical properties of the test material were not reported.

The deficiency and deviations did not have an impact on the acceptability of this study.

COMPLIANCE:

Signed and dated GLP, Quality Assurance and Data Confidentiality statements were provided. This study was conducted in compliance with USEPA Good Laboratory Practice Standards (40 CFR, Part 160, 1989), with the following exceptions: the latest water characterizations performed in June 2015, and the photographic data of test plants, were not collected in accordance with the stated GLP.

A. MATERIALS:

1. Test Material	GF-2726 (2,4-D Choline Salt + Glyphosate Dimethylammonium)
Description:	Solid
Lot No./Batch No.:	2C01163R01
Purity:	2,4-D Choline Salt: 24.1% Glyphosate DMA: 21.7%
Stability of compound under test conditions:	Analytical determinations for cabbage, cucumber, mustard, oilseed rape, onion, radish and tomato based on measured concentration of the three highest test concentrations in the initial spray solution yielded recoveries of 100-104% of nominal ($n = 6$). Analytical determinations based on measured concentration of the three highest test concentrations in the post application spray solution yielded recoveries of 99-102% of nominal ($n = 6$). Analytical determinations for buckwheat, corn, oat, sorghum, soybean, sunflower and wheat based on measured concentration of the five highest test

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concentrations in the initial spray solution yielded recoveries of 93-102% of nominal (n = 10). Analytical determinations based on measured concentration of the five highest test concentrations in the post application spray solution yielded recoveries of 96-105% of nominal (n = 10). The comparability between pre- and post-application spray solutions indicates the test substance was stable over the treatment period.

(OECD recommends chemical stability in water and light)

Storage conditions of test chemicals:

The test material was stored at room temperature.

Table 2. Physical/chemical properties of GF-2726.

Parameter	Values	Comments
Water solubility at 20°C	Not reported	
Vapor pressure	Not reported	
UV absorption	Not reported	
pKa	Not reported	
Kow	Not reported	

2. Test organism:

Monocotyledonous species: Corn (*Zea mays*, Poaceae; G05T82), Onion (*Allium cepa*, Amaryllidaceae; Yellow Granex Hybrid 33), Oat (*Avena sativa*, Gramineae; Cayuse), Sorghum (*Sorghum bicolor*, Poaceae; GSWNA51DR), and Wheat (*Triticum aestivum*, Poaceae; Triple 4); EPA recommends four monocots in two families, including corn.

Dicotyledonous species: Buckwheat (*Fagopyrum esculentum*, Polygonaceae; Common (OG)), Cabbage (*Brassica oleracea*, Brassicaceae; Copenhagen Market), Cucumber (*Cucumis sativus*, Cucurbitaceae; Straight Eight); Mustard (*Sinapis alba*, Brassicaceae; White Mustard), Oilseed rape (*Brassica napus*, Brassicaceae; Dwarf Essex); Radish (*Raphanus sativus*, Brassicaceae; Crimson Giant), Soybean (*Glycine max*, Leguminosae; Williams 82), Sunflower (*Helianthus annuus*, Compositeae; Royal Hybrid 1121F1), and Tomato (*Lycopersicon esculentum*, Solanaceae; Beef Steak); EPA recommends six dicots in four families, including soybean and a root crop.

OECD recommends a minimum of three species selected for testing, at least one from each of the following categories: Category 1: ryegrass, rice, oat, wheat, and sorghum; Category 2: mustard, rape, radish, turnip, and Chinese cabbage; Category 3: vetch, mung bean, red clover, fenugreek, lettuce, and cress.

Seed source: Corn and sorghum obtained from Syngenta Seed Care; oat and wheat obtained from L.A. Hearne Seed Co.; onion obtained from Park Seed Co.; cucumber obtained from NE Seed; buckwheat, mustard, oilseed rape, and sunflower obtained from Johnny's Selected Seeds; soybean obtained from Missouri Foundation Seeds; and cabbage, radish and tomato obtained from Sustainable Seed Co.

Prior seed treatment/sterilization: The seeds were not treated with any type of fungicides, insecticides, or any pesticides.

Historical % germination of seed: Corn, 100%; oat, 97%; onion , 91%; sorghum, 96%; wheat, 88%; buckwheat, 91%; cabbage, 89%; cucumber, 90%; mustard, 90%; oilseed rape, 95%; radish, 80%; soybean,

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89%; sunflower, 94%; and tomato, 93%.

Seed storage, if any: Not reported.

B. STUDY DESIGN:

1. Experimental Conditions

- a. Limit test: None.
- b. Range-finding study: None.
- c. Definitive Study

Table 3: Experimental Parameters - Seedling Emergence.

Parameters	Seedling Emergence	
	Details	Remarks
		<i>Criteria</i>
Duration of the test	21 days	<p><i>Recommended test duration is 14-21 days.</i></p> <p><i>OECD recommends that the test be terminated no sooner than 14 days after 50 percent of the control seedlings have emerged</i></p>
Number of seeds/plants/species/replicate	7 seeds per pot.	<p><i>Ten seeds per replicate should be used.</i></p> <p><i>OECD recommends a minimum of five seeds planted in each replicate within 24 hours of incorporation of the test substance. All seeds of each species for each test should be of the same size class. The seed should not be imbibed.</i></p>
<u>Number of replicates</u> Control: Adjuvant control: Treated:	6 N/A 6	<p><i>Four replicates per dose should be used.</i></p> <p><i>OECD recommends a minimum of four replicates per treatment</i></p>

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	Criteria	
<u>Test concentrations (lb ai/A)</u> Nominal: Measured:	0 (negative control), 0.00138, 0.0027, 0.0055, 0.0110, 0.0221, 0.044, 0.088, 0.176, 0.35, 0.71, and 1.41 lb 2,4-D Choline Salt/A Three highest test concentrations: <u>Onion, cabbage, cucumber, mustard, oilseed rape, radish, and tomato:</u> 0.36, 0.72, and 1.41 lb 2,4-D Choline Salt/A. Five highest test concentrations: <u>Corn, oat, grain sorghum, wheat, buckwheat, soybean, and sunflower:</u> 0.083, 0.179, 0.35, 0.70, and 1.41 lb 2,4-D Choline Salt/A.	Nominal concentrations for Glyphosate DMA: 0 (negative control), 0.00124, 0.0025, 0.0050, 0.0099, 0.0199, 0.040, 0.079, 0.159, 0.32, 0.64, and 1.27 lb Glyphosate DMA/A Nominal concentrations for GF-2726 product: 0.00572, 0.0114, 0.0229, 0.0457, 0.0915, 0.183, 0.366, 0.732, 1.46, 2.93, and 5.85 lb product/A. <i>Five test concentrations should be used with a dose range of 2X or 3X progression</i> <i>OECD recommends three concentrations, preferably with application rates equivalent to 0.0 (control), 1.0, 10.0 and 100 mg substance per kg of oven-dried soil.</i>
<u>Method and interval of analytical verification</u> LOQ: LOD:	Spray solutions were analyzed by HPLC using a Waters Symmetry C18 column. 0.0072-0.0184 lb 2,4-D Choline Salt/A (MQL) Not reported.	2,4-D acid, the acid equivalent active ingredient of GF-2726, was measured in the spray solutions, and converted to 2,4-D Choline Salt concentrations.
Adjuvant (type, percentage, if used)	N/A	
<u>Test container (pot)</u> Size/Volume Material: (glass/polystyrene)	Pots with top diameter of 16.5 cm x bottom diameter of 12.2 cm x 11.5 cm depth. Plastic	<i>Non-porous containers should be used.</i> <i>OECD recommends that non-porous plastic or glazed pot be used.</i>
Growth facility	Greenhouse	
Method/depth of seeding	Corn, oat, cucumber, soybean, and sunflower planted at 20 mm depth; onion, cabbage, mustard, oilseed rape, and tomato planted at 6 cm depth; sorghum, wheat,	

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	<i>Criteria</i>	
	buckwheat, and radish at 12 mm depth.	
<u>Test material application</u> Application time including the plant growth stage	After planting	
Number of applications	1	
Application interval	N/A- single application	
Method of application	Application of the test substance was made using an overhead track sprayer (De Vries) equipped with a TeeJet 4002E nozzle operated at 40 psi, approximately 27 inches above the soil surface (140 L/ha nominal spray volume)	
<u>Details of soil used</u> Geographic location Depth of soil collection Soil texture % sand % silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	Lime Spring, Iowa N/A Sandy loam 71 18 11 6.4 1.5% 11.0 meq/100g 13.9%	Top soil mixed with silica sand. Organic Matter: 2.5% <i>Soil mixes containing sandy loam, loam, or clay loam soil with no greater than 2% organic matter are preferable. Glass beads, rock wool, and 100% acid washed sand are not preferred.</i> <i>OECD prefers the soil to be sieved (0.5 cm) to remove coarse fragments. Carbon content should not exceed 1.5% (3% organic matter). Fine particles (under 20um) makeup should be between 10 and 20%. The recommended pH is between 5.0 and 7.5.</i>
Details of nutrient medium, if used	Peter's 20-20-20 (1/2 tablespoon/gallon). Applied once via sub-irrigation to all species.	
<u>Watering regime and schedules</u> Water source/type: Volume applied: Interval of application: Method of application:	Top watered once post-application, then sub-irrigation. Well water. Not reported. Daily. The plants were bottom watered daily as needed.	 <i>EPA prefers that bottom watering be utilized for seedling emergence studies so that the chemical is not leached out of the soil during the test.</i>

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	Details	Remarks
	<i>Criteria</i>	
Any pest control method/fertilization, if used	None reported.	
<u>Test conditions</u> Temperature: Photoperiod:	<u>Onion, cabbage, cucumber, mustard, oilseed rape, radish, and tomato:</u> mean 21.6, range 13.9-27.9°C 16L:8D Natural sunlight supplemented with artificial light.	
Light intensity and quality: Relative humidity:	mean 243, mean range 142-320 PAR ($\mu\text{mol/m}^2/\text{sec}$) <u>Corn, oat, grain sorghum, wheat, buckwheat, soybean, and sunflower:</u> mean 78, range 34-91%	
Temperature: Photoperiod:	mean 22.8, range 19.0-28.1°C 16L:8D Natural sunlight supplemented with artificial light.	
Light intensity and quality: Relative humidity:	mean 173, mean range 122-234 PAR ($\mu\text{mol/m}^2/\text{sec}$) mean 66, range 18-90%	<i>EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.</i> <i>OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.</i>
<u>Reference chemical (if used)</u> Name: Concentrations:	N/A	
Other parameters, if any	None	

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2. Observations:

Table 4: Observation Parameters - Seedling Emergence.

Parameters	Seedling Emergence	
	Details	Remarks
Parameters measured (e.g., number of germinated seeds, emerged seedlings, plant height, dry weight or other endpoints)	- Emergence - Survival - Shoot height - Total dry weight - Phytotoxicity	
Measurement technique for each parameter	Emergence and phytotoxicity were visually determined. Survival was defined as the percent of emerged. Height was measured from the base of the stem to the tip of the longest leaf or apical bud. Total replicate weight was determined following drying.	
Observation intervals	Each pot was inspected weekly, emergence and survival determined. Dry weight and shoot height were recorded at study termination.	
Other observations, if any	N/A	
Were raw data included?	Yes	
Phytotoxicity rating system, if used	No effect, 1-10, no effect; 20-30, slight effect; 40-60, moderate effect; 70-100, severe effect; 100, complete effect.	Frans, R.E. and R.E. Talbert, 1977.

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

1. Seedling Emergence:

Seedling emergence in the negative control ranged from 86 to 100%. The study author reported significant inhibitions in seedling emergence in cabbage, mustard, onion, radish, and tomato compared to the negative control. For radish, significant inhibitions in emergence were observed at 0.35, 0.71, and 1.41 lb 2,4-D

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Choline Salt/A; for cabbage, mustard and tomato, significant inhibitions in emergence were observed at 0.71, and 1.41 lb 2,4-D Choline Salt/A; and for onion, significant inhibitions in emergence were observed at 1.41 lb 2,4-D Choline Salt/A (Cochran-Armitage test, p<0.05) (amount of inhibitions compared to the negative control were not reported). The reviewer found significant inhibitions in emergence compared to the negative control in the same species. The reviewer found significant inhibitions in emergence in cabbage of 41% for both, in mustard of 23 and 36%, and in radish of 21 and 45% at the 0.72 and 1.41 lb 2,4-D Choline Salt/A treatment level, respectively (Dunnett's test or Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in onion and tomato emergence of 22 and 25%, respectively, were observed at the highest concentration only, 1.41 lb 2,4-D Choline Salt/A (Mann-Whitney U Two-Sample test or Jonckheere-Terpstra Step-Down test, p<0.05).

Study author survival was based on the number emerged, and in the negative control, survival was 100%. The study author reported significant inhibitions for survival in mustard and radish survival only at the highest concentration tested, 1.41 lb 2,4-D Choline Salt/A (Cochran-Armitage test, p<0.05) (amount of inhibitions compared to the negative control were not reported).

The reviewer based survival on the number planted, and survival in the negative control ranged from 86 to 100%. The reviewer found significant inhibitions in survival for cabbage, mustard, onion, radish and tomato compared to the negative control. Significant inhibitions in survival were 41% for both in cabbage, 23 and 41% in mustard, 19 and 39% in onion, and 21 and 47% in radish, at 0.72 and 1.41 lb 2,4-D Choline Salt/A, respectively (Dunnett's test, Mann-Whitney U Two-Sample test, or Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in tomato survival of 25% were observed at the highest concentration only, 1.41 lb 2,4-D Choline Salt/A (Mann-Whitney U Two-Sample test, p<0.05).

The study author found significant inhibitions in seedling height compared to the negative control in all species except corn, cucumber, sorghum, soybean, sunflower, and wheat. Significant inhibitions in cabbage height were 30, 52, and 65%, and in mustard height were 15, 50, and 65%, at the 0.35, 0.71, and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively (Jonckheere-Terpstra test, p<0.05). Significant inhibitions in oilseed rape height were 17 and 22%, and in onion height were 27 and 43%, at the 0.71, and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively (Jonckheere-Terpstra test, p<0.05). Significant inhibitions were observed at the highest concentration tested only, 1.41 lb 2,4-D Choline Salt/A, in buckwheat (15%), oat (15%), radish (27%), and tomato (26%). The reviewer found the same significant inhibitions in seedling height (Dunnett's test, Mann-Whitney U Two-Sample test, or Jonckheere-Terpstra Step-Down test, p<0.05).

The study author found significant inhibitions in dry weight in cabbage, mustard, oilseed rape, onion, radish, sunflower, and tomato compared to the negative control. Significant inhibitions in cabbage dry weight were 27, 55, 81, and 87% at the 0.176, 0.35, 0.71, and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively (Jonckheere-Terpstra test, p<0.05). Mustard significant inhibitions in dry weight were 20, 67, and 82%, oilseed rape significant inhibitions in dry weight were 17, 33, and 41%, and radish significant inhibitions in dry weight were 22, 49, and 80%, at the 0.35, 0.71, and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively (Jonckheere-Terpstra test, p<0.05). The study author also reported significant inhibitions at the highest concentration only, 1.41 lb 2,4-D Choline Salt/A, for onion (69%), sunflower (11%), and tomato (60%) (Jonckheere-Terpstra test, p<0.05).

The reviewer found significant inhibitions in dry weight in cabbage, mustard, oilseed rape, onion, radish, and tomato compared to the negative control. The reviewer observed significant inhibitions in radish dry weight of 7 to 60% from the 0.088 to the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in cabbage dry weight were 50, 72 and 83%, in mustard dry weight were 19, 58 and 71%, and in oilseed rape dry weight were 16, 34 and 43% at the 0.36, 0.72 and 1.41 lb 2,4-D Choline Salt/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05). Significant inhibitions in dry weight were observed

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at the highest concentration tested only, 1.41 lb 2,4-D Choline Salt/A, in onion (47%), and tomato (46%) (Dunnett's test or Jonckheere-Terpstra Step-Down test, p<0.05). Differences in dry weight effects between the study author and reviewer may be related to the study author using total dry weight for the replicate and not mean dry weight.

Based on the study author's results, the most sensitive monocot was onion based on dry weight, with NOEC and EC₂₅ values of 0.71 and 0.49 lb 2,4-D Choline Salt/A, respectively; the most sensitive dicot was cabbage based on dry weight, with NOEC and EC₂₅ values of 0.088 and 0.12 lb 2,4-D Choline Salt/A, respectively.

There were none to slight phytotoxic effects (≤ 30) in all species except cabbage and mustard; moderate effects (40-60) were observed in cabbage and mustard. Phytotoxic effects were dose-related in cabbage, corn, cucumber, mustard, onion, radish, sorghum, and tomato.

B. REPORTED STATISTICS:

Emergence, survival, replicate shoot dry weight, and height mean and standard deviations were determined. Statistical analysis of rate versus effect data was performed using SAS Version 9.3. Emergence and survival data were tested using a combination of Fisher's Exact Comparison with Bonferroni-Holm Adjustment, and Cochran Armitage test. Length and weight data sets were tested for normality (Shapiro-Wilk) and homogeneity of variance (Levene). Non-normal and/or non-homogeneous data sets were analyzed using non-parametric procedures (Wilcoxon scores analyzed using Dunn's multiple comparison), as well as trend testing (Jonckheere's). Normally distributed and homogenous data sets were analyzed using parametric procedures (Dunnett's pair-wise comparison), as well as trend testing (Jonckheere's). All statistical determinations were made with 95% certainty. Due to significant effects from NOER determinations, emergence and post-emergent survival data were analyzed using Probit methods, and plant shoot length and dry weight data was analyzed using non-linear regression dose-response models (Bruce, Versteeg Weighted Probit, Schabenberger Hormetic, and OECD Model 2; all models were fitted to the data using the Marquardt method). Nominal concentrations were used for all analyses.

Table 5: Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for height (lbs 2,4-D Choline Salt/A)									
	height (mm)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Buckwheat ¹	380-447	0.71	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Cabbage ²	22.6-75.2	0.18	ND	N/A	0.23	0.16-0.33	0.72	0.41-1.25	N/A	N/A
Corn	620-674	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Cucumber	50-63.7	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Mustard ³	44.2-79.3	0.18	ND	N/A	0.30	0.20-0.44	0.72	0.58-0.90	N/A	N/A
Oat ⁴	39-137	0.71	ND	N/A	>1.41	1.17-5.21	>1.41	1.23-29.9	N/A	N/A

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Species	Results summary for height (lbs 2,4-D Choline Salt/A)									
	height (mm)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Oilseed rape ⁵	385-463	0.35	ND	N/A	1.35	0.37-2.33	>1.41	ND	N/A	N/A
Onion ⁶	65.7-108	0.35	ND	N/A	0.67	0.46-1.00	>1.41	ND	N/A	N/A
Radish ⁷	51.3-77.3	0.71	ND	N/A	1.06	0.77-1.45	>1.41	ND	N/A	N/A
Sorghum	316-344	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Soybean	195-229	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Sunflower	275-314	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Tomato ⁸	90-121	0.71	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Wheat	314-338	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A

ND- Not determined. NC- Not calculable.

¹ Significant decrease in buckwheat height, inhibition of 15% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra test, p<0.05).

² Significant decrease in cabbage height, inhibition of 30, 52 and 65% at the 0.35, 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

³ Significant decrease in mustard height, inhibition of 15, 50 and 65% at the 0.35, 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁴ Significant decrease in oat height, inhibition of 15% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁵ Significant decrease in oilseed rape height, inhibition of 17 and 22% at the 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁶ Significant decrease in onion height, inhibition of 27 and 43% at the 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁷ Significant decrease in radish height, inhibition of 27% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁸ Significant decrease in tomato height, inhibition of 26% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra test, p<0.05).

Table 5a: Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for biomass (lbs 2,4-D Choline Salt/A)									
	weight (g)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Buckwheat	0.475-0.61	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Cabbage ¹	0.00841-0.0643	0.088	ND	N/A	0.12	0.057-0.18	0.28	0.14-0.43	N/A	N/A
Corn	0.576-0.621	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A

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Species	Results summary for biomass (lbs 2,4-D Choline Salt/A)									
	weight (g)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Cucumber	0.166-0.223	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Mustard ²	0.0163- 0.0723	0.176	ND	N/A	0.19	0.063-0.32	0.46	0.15-0.77	N/A	N/A
Oat	0.137-0.176	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Oilseed rape ³	0.0282-0.0882	0.176	ND	N/A	0.44	0.10-0.79	1.07	0.24-1.90	N/A	N/A
Onion ⁴	0.00306-0.00614	0.71	ND	N/A	0.49	0.17-0.81	1.18	0.40-1.96	N/A	N/A
Radish ⁵	0.024-0.0759	0.176	ND	N/A	0.29	0.14-0.44	0.69	0.33-1.05	N/A	N/A
Sorghum	0.147-1.88	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Soybean	0.511-0.67	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Sunflower ⁶	0.611-0.74	0.71	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Tomato ⁷	0.0347-0.0643	0.71	ND	N/A	0.73	0.19-1.26	>1.41	0.46-3.04	N/A	N/A
Wheat	0.0692-0.116	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A

ND- Not determined. NC- Not calculable.

¹ Significant decrease in cabbage dry weight, inhibition of 27, 55, 81 and 87% at the 0.176, 0.35, 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

² Significant decrease in mustard dry weight, inhibition of 20, 67 and 82% at the 0.35, 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

³ Significant decrease in oilseed rape dry weight, inhibition of 17, 33, and 41% at the 0.35, 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁴ Significant decrease in onion dry weight, inhibition of 69% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁵ Significant decrease in radish dry weight, inhibition of 22, 49, and 80% at the 0.35, 0.71 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁶ Significant decrease in sunflower dry weight, inhibition of 11% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra test, p<0.05).

⁷ Significant decrease in tomato dry weight, inhibition of 60% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra test, p<0.05).

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Table 5b: Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for emergence (lbs 2,4-D Choline Salt/A)									
	%	NOEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	95%CI
Buckwheat	91-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Cabbage ¹	52-88	0.35	ND	N/A	0.86	0.13-2.65	>1.41	ND	N/A	N/A
Corn	95-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Cucumber	86-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Mustard ²	60-98	0.35	ND	N/A	0.89	ND	>1.41	ND	N/A	N/A
Oat	91-98	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Oilseed rape	88-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Onion ³	67-86	0.71	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Radish ⁴	50-100	0.176	ND	N/A	0.66	0.37-1.07	1.39	0.89-4.17	N/A	N/A
Sorghum	86-98	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Soybean	86-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Sunflower	93-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Tomato ⁵	71-95	0.35	ND	N/A	1.21	0.86-2.14	>1.41	ND	N/A	N/A
Wheat	93-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A

ND- Not determined. NC- Not calculable.

¹ Significant inhibition in cabbage emergence at the 0.71 and 1.41 lb ai/A treatment levels compared to the control; inhibitions not reported (Cochran-Armitage test, p<0.05).

² Significant inhibition in mustard emergence at the 0.71 and 1.41 lb ai/A treatment levels compared to the control; inhibitions not reported (Cochran-Armitage test, p<0.05).

³ Significant inhibition in onion emergence at the 1.41 lb ai/A treatment level compared to the control; inhibitions not reported (Cochran-Armitage test, p<0.05).

⁴ Significant inhibition in radish emergence at the 0.35, 0.71 and 1.41 lb ai/A treatment levels compared to the control; inhibitions not reported (Cochran-Armitage test, p<0.05).

⁵ Significant inhibition in tomato emergence at the 0.71 and 1.41 lb ai/A treatment levels compared to the control; inhibitions not reported (Cochran-Armitage test, p<0.05).

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Table 5c Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for survival (lbs 2,4-D Choline Salt/A); based on # emerged									
	%	NOEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	95%CI
Buckwheat	100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Cabbage	97-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Corn	98-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Cucumber	95-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Mustard ¹	92-100	0.71	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Oat	98-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Oilseed rape	98-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Onion	83-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Radish ²	96-100	0.71	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Sorghum	100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Soybean	98-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Sunflower	100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Tomato	97-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A
Wheat	98-100	1.41	ND	N/A	>1.41	ND	>1.41	ND	N/A	N/A

ND- Not determined. NC- Not calculable.

¹ Significant inhibition in mustard survival at the 1.41 lb ai/A treatment level compared to the control; inhibitions not reported (Cochran-Armitage test, p<0.05).

² Significant inhibition in radish survival at the 1.41 lb ai/A treatment level compared to the control; inhibitions not reported (Cochran-Armitage test, p<0.05).

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Mid-study emergence														
Control	Buck wheat	Cabbage	Corn	Cucumber	Mustard	Oat	Oilseed rape	Onion	Radish	Sorghum	Soy-bean	Sun-flower	Tomato	Wheat
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Formula Blank is N/A.

Plant Injury Index*														
Control	Buck wheat	Cabbage	Corn	Cucumber	Mustard	Oat	Oilseed rape	Onion	Radish	Sorghum	Soy-bean	Sun-flower	Tomato	Wheat
0	0	0-65	0-2	0-13	0-68	0	0-17	0-30	0-23	0-18	0	0-2	0-20	0

Formula Blank is N/A.

*1-10 = no effect; 20-30 = slight effect; 40-60 = moderate effect; 70-100 = severe effect; 100 = complete effect.

C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

All analyses were conducted comparing treated to the negative control. These analyses were conducted using CETIS version 1.8.7.12 and backend settings approved for use by EFED on 10/20/2015. Data for each endpoint were tested to determine if their distributions were normal and if their variances were homogeneous using Shapiro-Wilk's and Levene's tests, respectively. Data that satisfied these assumptions were subjected to Dunnett's and William's tests, and data that did not satisfy these assumptions were subjected to the non-parametric Mann-Whitney U and Jonckheere's tests. Measured concentrations were used in analyses for the three highest treatment levels for cabbage, cucumber, mustard, oilseed rape, onion, radish and tomato, the five highest treatment levels for buckwheat, corn, oat, sorghum, soybean, sunflower and wheat. Nominal concentrations were used for all other treatment levels. Linear (survival and emergence) and nonlinear (height and dry weight) regression models were used to interpret EC/ICx values.

Additional analyses (Table 6d) were performed for sublethal endpoints (i.e., height and weight) for select species, given the significant impacts on plant survival, which may have contributed to the poor data fit to the nonlinear models for these EC/ICx estimates. For cabbage, mustard, onion, radish, and tomato, nonlinear regressions were run for growth endpoints while excluding the two highest treatment levels, 0.72 and 1.41 lbs ai/A.

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Table 6: Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for height (lbs 2,4-D Choline Salt/A)									
	height (mm)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Buckwheat ^{1*}	380-447	0.70	0.416	0.0788-0.879	4.59*	0.221-20.4	NC	N/A	N/A	N/A
Cabbage ^{2#}	22.6-75.2	0.176	0.0602	0.0257-0.0911	0.244	0.19-0.306	0.647	0.56-0.749	N/A	N/A
Corn	620-674	1.41	>1.41	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A
Cucumber	50-63.7	1.41	1.34	N/A-1.41	1.51	1.43- 1.58	1.64	1.59-1.69	N/A	N/A
Mustard ^{3#}	39-137	0.176	0.0851	N/A-0.142	0.303	0.211-0.41	0.732	0.603-0.887	N/A	N/A
Oat ^{4*}	385-463	0.70	0.673	0.137- 1.08	2.48*	0.859-4.81	6.1*	0.459-81.8	N/A	N/A
Oilseed rape ^{5*#}	65.7-108	0.36	0.0133	N/A-0.0945	1.5	0.226-6.63	39.9*	0.114-14000	N/A	N/A
Onion ^{6#}	44.2-79.3	0.36	0.158	N/A-0.297	0.683	0.487-0.915	1.88	1.2-2.96	N/A	N/A
Radish ⁷	51.3-77.3	0.72	0.306	N/A- 0.546	1.06	0.789 1.38	2.53	1.34-4.79	N/A	N/A
Sorghum	316-344	1.41	>1.41	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A
Soybean*	195-229	1.41	0.0024	N/A- 0.656	59500*	N/A-3.37E+13	NC	N/A	N/A	N/A
Sunflower*	275-314	1.41	10.1*	N/A-39000	NC	N/A	NC	N/A	N/A	N/A
Tomato ^{8*#}	90-121	0.72	0.641	N/A- 1.1	1.74	0.935 2.68	3.48*	0.485- 25	N/A	N/A
Wheat	314-338	1.41	>1.41	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A

ND- Not determined. NC- Not calculable.

*Endpoints and/or confidence intervals are outside the tested range of concentrations and should be interpreted with caution.

Jonckheere-Terpstra Step-Down test selected for trends analysis; CETIS was unable to run the Williams test on more than 10 treatment levels.

¹ Significant decrease in buckwheat height, inhibition of 15% at the 1.41 lb ai/A treatment level compared to the negative control (Dunnett's test, p<0.05).

² Significant decrease in cabbage height, inhibition of 30, 52 and 65% at the 0.36, 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

³ Significant decrease in mustard height, inhibition of 15, 50 and 65% at the 0.36, 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁴ Significant decrease in oat height, inhibition of 15% at the 1.41 lb ai/A treatment level compared to the negative control (Mann-Whitney U Two-Sample test, p<0.05).

⁵ Significant decrease in oilseed height, inhibition of 17 and 22% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁶ Significant decrease in onion height, inhibition of 27 and 43% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁷ Significant decrease in radish height, inhibition of 27% at the 1.41 lb ai/A treatment level compared to the negative control (Dunnett's test, p<0.05).

⁸ Significant decrease in tomato height, inhibition of 26% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

Data Evaluation Record on the Acute Toxicity of GF-2726 (2,4-D Choline Salt + Glyphosate DMA) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

EPA MRID Number 49903201

Table 6a: Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for biomass (lbs 2,4-D Choline Salt/A)									
	Weight (g)	NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Buckwheat	0.475-0.61	1.41	NC	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A
Cabbage ¹	0.00841-0.0643	0.176	0.0309	N/A-0.0575	0.115	0.0727-0.168	0.288	0.223-0.372	N/A	N/A
Corn	0.576-0.621	1.41	>1.41	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A
Cucumber	0.166-0.223	1.41	NC	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A
Mustard ²	0.0163-0.0723	0.176	0.0446	N/A-0.112	0.201	0.089-0.364	0.574	0.386-0.851	N/A	N/A
Oat	0.137-0.176	1.41	0.648	N/A-1.51	1.97	N/A-5.2	NC	N/A	N/A	N/A
Oilseed rape ^{3*}	0.0282-0.0882	0.176	0.0713	0.0132-0.247	0.611	0.201-1.75	6.95*	0.661-229	N/A	N/A
Onion ^{4#}	0.00306-0.00614	0.72	0.26	N/A- 0.53	0.752	0.433-1.13	1.57	0.984-2.51	N/A	N/A
Radish ⁵	0.024-0.0759	0.044	0.231	N/A-0.412	0.585	0.349-0.849	1.12	0.855-1.46	N/A	N/A
Sorghum*	0.147-1.88	1.41	0.088	N/A- 1.13	22*	N/A-42200	NC	N/A	N/A	N/A
Soybean	0.511-0.67	1.41	>1.41	NC	>1.41	N/A	>1.41	N/A	N/A	N/A
Sunflower	0.611-0.74	1.41	0.478	0.000705-5.49	NC	N/A	NC	N/A	N/A	N/A
Tomato ^{6#}	0.0347-0.0643	0.72	0.747	N/A- 1.26	1.19	0.63- 1.6	1.65	1.05- 2.59	N/A	N/A
Wheat ⁷	0.0692-0.116	1.41	NC	N/A	NC	N/A	>1.41	N/A	N/A	N/A

ND- Not determined. NC- Not calculable.

*Endpoints and/or confidence intervals are outside the tested range of concentrations and should be interpreted with caution.

Jonckheere-Terpstra Step-Down test selected for trends analysis; CETIS was unable to run the Williams test on more than 10 treatment levels.

¹ Significant decrease in cabbage dry weight, inhibition of 50, 72 and 83% at the 0.36, 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

² Significant decrease in mustard dry weight, inhibition of 19, 58 and 71% at the 0.36, 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

³ Significant decrease in oilseed rape dry weight, inhibition of 16, 34 and 43% at the 0.36, 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁴ Significant decrease in onion dry weight, inhibition of 47% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁵ Significant decrease in radish dry weight, inhibition of 7 to 60% from the 0.088 to the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁶ Significant decrease in tomato dry weight, inhibition of 46% at the 1.41 lb ai/A treatment level compared to the negative control (Dunnett's test, p<0.05).

⁷ Decrease in wheat dry weight of 29% at the 0.0027 lb ai/A treatment level was not significant (Dunnett's test, p>0.05).

Data Evaluation Record on the Acute Toxicity of GF-2726 (2,4-D Choline Salt + Glyphosate DMA) to Terrestrial Vascular Plants: Seedling Emergence

PMRA Submission Number {.....}

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Table 6b: Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for emergence (lbs 2,4-D Choline Salt/A)									
	%	NOEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	95%CI
Buckwheat	91-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Cabbage ^{1*#}	52-88	0.36	0.0000027	N/A-0.000294	0.0534	0.00206-1.11	51.1*	1.78-1E+10	0.226	0.0402-0.412
Corn	95-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Cucumber	86-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Mustard ^{2*}	60-98	0.36	0.00648	0.000186-0.0246	1.19	0.335-30.3	44.4*	4.45-59000	0.429	0.199-0.659
Oat	91-98	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Oilseed rape	88-100	1.41	>1.41	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A
Onion ^{3*#}	67-86	0.72	0.0000000	N/A 8.12E-05	0.82	0.0896-1E+10	54000*	47.7-1E+10	N/A	N/A
Radish ⁴	50-100	0.36	0.0274	0.00639-0.0605	0.54	0.273-1.54	4.28	1.51-35.8	N/A	N/A
Sorghum	86-98	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Soybean	86-100	1.41	NC	N/A	NC	N/A	>1.41	N/A	N/A	N/A
Sunflower	93-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Tomato ^{5*}	71-95	0.72	0.0015	N/A-0.0121	6.37*	0.665-3000000	2120*	23-1E+10	0.267	0.0693-0.466
Wheat	93-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A

ND- Not determined. NC- Not calculable.

*Endpoints and/or confidence intervals are outside the tested range of concentrations and should be interpreted with caution.

Jonckheere-Terpstra Step-Down test selected for trends analysis; CETIS was unable to run the Williams test on more than 10 treatment levels.

¹ Significant decrease in cabbage emergence, inhibition of 41% at both the 0.72 and 1.41 lb ai/A treatment levels compared to the negative control (Dunnett's test, p<0.05). CV was high, 73 and 66%, at the 0.72 and 1.41 lb ai/A treatment levels, respectively.

² Significant decrease in mustard emergence, inhibition of 23 and 36% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

³ Significant decrease in onion emergence, inhibition of 22% at the 1.41 lb ai/A treatment level compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁴ Significant decrease in radish emergence, inhibition of 21 and 45% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁵ Significant decrease in tomato emergence, inhibition of 25% at the 1.41 lb ai/A treatment level compared to the negative control (Mann-Whitney U Two-Sample test, p<0.05).

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Table 6c: Effect of GF-2726 on 21-Day Seedling Emergence

Species	Results summary for survival (lbs 2,4-D Choline Salt/A); based on # planted									
	%	NOEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	slope	95%CI
Buckwheat	91-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Cabbage ^{1*} #	52-88	0.36	0.0000036	N/A-0.000295	0.0469	0.00246-0.513	33.8*	1.57-1E+10	0.236	0.0536-0.418
Corn	95-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Cucumber	86-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Mustard ^{2*}	55-98	0.36	0.00667	0.000253-0.0241	0.851	0.271-11.9	24.8*	3.22-9510	0.461	0.224-0.698
Oat	91-98	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Oilseed rape	88-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Onion ^{3*} #	52-86	0.36	0.0000031	N/A-0.000151	0.0832	0.0186-0.587	98.3*	4.78-15400000	0.22	0.0852-0.354
Radish ^{4*}	48-100	0.36	0.0276	0.00636-0.061	0.508	0.259-1.4	3.85*	1.4-30.3	N/A	N/A
Sorghum	86-98	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Soybean	52-88	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Sunflower	93-100	1.41	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Tomato ^{5*}	71-95	0.72	0.00163	N/A-0.012	4.8*	0.596-140000	1240*	19.1-1E+10	0.28	0.0824-0.477
Wheat	93-100	1.41	>1.41	N/A	>1.41	N/A	>1.41	N/A	N/A	N/A

ND- Not determined. NC- Not calculable.

*Endpoints and/or confidence intervals are outside the tested range of concentrations and should be interpreted with caution.

Jonckheere-Terpstra Step-Down test selected for trends analysis; CETIS was unable to run the Williams test on more than 10 treatment levels.

¹ Significant decrease in cabbage survival, inhibition of 41% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Dunnett's test, p<0.05). CV was high, 73 and 66%, at the 0.72 and 1.41 lb ai/A treatment levels, respectively.

² Significant decrease in mustard survival, inhibition of 23 and 41% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Mann-Whitney U Two-Sample test, p<0.05).

³ Significant decrease in onion survival, inhibition of 19 and 39% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁴ Significant decrease in radish survival, inhibition of 21 and 47% at the 0.72 and 1.41 lb ai/A treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, p<0.05).

⁵ Significant decrease in tomato survival, inhibition of 25% at the 1.41 lb ai/A treatment level compared to the negative control (Mann-Whitney U Two-Sample test, p<0.05).

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Mid-study emergence														
Control	Buck wheat	Cabbage	Corn	Cucumber	Mustard	Oat	Oilseed rape	Onion	Radish	Sorghum	Soy-bean	Sun-flower	Tomato	Wheat
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Formula Blank is N/A.

Plant Injury Index*														
Control	Buck wheat	Cabbage	Corn	Cucumber	Mustard	Oat	Oilseed rape	Onion	Radish	Sorghum	Soy-bean	Sun-flower	Tomato	Wheat
0	0	0-65	0-2	0-13	0-68	0	0-17	0-30	0-23	0-18	0	0-2	0-20	0

Formula Blank is N/A.

*1-10 = no effect; 20-30 = slight effect; 40-60 = moderate effect; 70-100 = severe effect; 100 = complete effect.

Table 6d: Effect of GF-2726 on 21-Day Seedling Emergence – Reanalysis excluding significant mortality*

Species	Results summary for height (lbs 2,4-D Choline Salt/A)									
	height (mm)	Survival NOEC/Height NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Cabbage	22.6-75.2	0.36/0.176	0.0758	N/A- 0.128	0.256	0.197-0.323	0.598	0.36-0.995	N/A	N/A
Mustard	39-137	0.36/0.36	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Onion	44.2-79.3	0.36/0.176	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Radish	51.3-77.3	0.36/0.36	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Tomato	90-121	0.72/0.72	NC	N/A	NC	N/A	NC	N/A	N/A	N/A

* The two highest treatment levels were excluded for all species above in this regression analysis. Tomato was additionally run with only the top highest treatment level excluded.

NC=Not calculable

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Species	Results summary for biomass (lbs 2,4-D Choline Salt/A)									
	Weight (g)	Survival NOEC/Biomass NOEC	IC ₀₅	95%CI	IC ₂₅	95%CI	IC ₅₀	95%CI	slope	95%CI
Cabbage	0.00841-0.0643	0.36/0.176	0.0381	N/A-0.0744	0.122	0.0713-0.183	0.274	0.201-0.373	N/A	N/A
Mustard	0.0163-0.0723	0.36/0.176	0.0207	N/A-0.12	0.232	0.0531-0.652	1.25	0.00214-727	N/A	N/A
Onion	0.00306-0.00614	0.36/0.36	0.33	N/A-0.357	0.372	0.333-0.397	0.404	0.386-0.422	N/A	N/A
Radish	0.024-0.0759	0.36/0.36	0.0104	N/A-0.186	1.9	N/A-323	NC	N/A	N/A	N/A
Tomato	0.0347-0.0643	0.72/0.72	0.382	N/A-0.473	NC	N/A	NC	N/A	N/A	N/A

* The two highest treatment levels were excluded for all species above in this regression analysis. Tomato was additionally run with only the top highest treatment level excluded.

NC=Not calculable

2,4-D Choline Salt

Monocot

Most sensitive monocot: Onion based on survival*

EC ₅₀ /IC ₅₀ : 98.3 lb ai/A	95% C.I.: 4.78-15400000 lb ai/A
EC ₂₅ /IC ₂₅ : 0.0832 lb ai/A	95% C.I.: 0.0186-0.587 lb ai/A
EC ₀₅ /IC ₀₅ : 0.0000031 lb ai/A	95% C.I.: N/A-0.000151 lb ai/A
NOEC: 0.36 lb ai/A	
Slope: 0.22	95% C.I.: 0.0852-0.354

Most sensitive monocot: Onion based on biomass (Preferred)

EC ₅₀ /IC ₅₀ : 0.404 lb ai/A	95% C.I.: N/A
EC ₂₅ /IC ₂₅ : 0.372 lb ai/A	95% C.I.: 0.333-0.397 lb ai/A
EC ₀₅ /IC ₀₅ : 0.33 lb ai/A	95% C.I.: N/A-0.357 lb ai/A
NOEC: 0.36 lb ai/A	
Slope: N/A	

* Studies are designed to capture sub-lethal effects, therefore, survival is not expected to be the most sensitive endpoint.

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Dicot

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Most sensitive dicot: Cabbage; based on survival*

EC ₅₀ /IC ₅₀ : 33.8 lb ai/A	95% C.I.: 1.57-1E10 lb ai/A
EC ₂₅ /IC ₂₅ : 0.0469 lb ai/A	95% C.I.: 0.00246-0.513 lb ai/A
EC ₀₅ /IC ₀₅ : 0.0000036 lb ai/A	95% C.I.: N/A-0.000295 lb ai/A
NOEC: 0.36 lb ai/A	
Slope: 0.236	95% C.I.: 0.0536-0.418

Most sensitive dicot: Cabbage; based on biomass (Preferred)

EC ₅₀ /IC ₅₀ : 0.274 lb ai/A	95% C.I.: 0.201-0.373 lb ai/A
EC ₂₅ /IC ₂₅ : 0.122 lb ai/A	95% C.I.: 0.0713-0.183 lb ai/A
EC ₀₅ /IC ₀₅ : 0.0381 lb ai/A	95% C.I.: N/A-0.007445 lb ai/A
NOEC: 0.0176 lb ai/A	
Slope: N/A	

* Studies are designed to capture sub-lethal effects, therefore, survival is not expected to be the most sensitive endpoint.

D. STUDY DEFICIENCIES:

2. Survival was the most sensitive endpoint for cabbage, onion and radish. Onion and cabbage were also the most sensitive monocot and dicot based on survival. Studies are designed to capture sub-lethal effects, therefore survival is not expected to be the most sensitive endpoint. Inhibitions in survival may have impacted the confidence of the other endpoints for cabbage, onion and radish. (*Note: To account for this deficiency additional analyses were performed for these species, eliminating the confounding survival-impaired treatment groups from statistical analyses for sublethal endpoints. These result produced more confident sublethal endpoint estimates and serve as the basis for across species sensitivity comparisons.*)
3. The physico-chemical properties of the test material were not reported.

E. REVIEWER'S COMMENTS:

The reviewer and study author selected the same monocot and dicot for the most sensitive species, but the most sensitive endpoints were different. Based on the study author's results, the most sensitive monocot was onion based on dry weight, with NOEC and EC₂₅ values of 0.71 and 0.49 lb 2,4-D Choline Salt/A, respectively; the most sensitive dicot was cabbage based on dry weight, with NOEC and ER₂₅ values of 0.088 and 0.12 lb 2,4-D Choline Salt/A, respectively. The reviewer determined that the most sensitive monocot was onion based on survival with NOAEC and EC₂₅ values of 0.36 and 0.0832 lb 2,4-D Choline Salt/A, respectively. The most sensitive dicot was cabbage based on survival with NOAEC and EC₂₅ values of 0.36 and 0.0469 lb 2,4-D Choline Salt/A, respectively. The reviewer determined survival based on the number planted, while the study author determined survival based on the number of seedlings emerged. This discrepancy likely contributed to the difference determining the most sensitive endpoint. The reviewer's results are presented in the Executive Summary and Conclusions sections of this DER.

The high mortality at the highest treatment concentrations in cabbage, onion and radish may have confounded growth and affected determination of the most sensitive endpoints. The reviewer selected the Jonckheere-Terpstra Step-Down test for trends analysis for onion survival and other species endpoints

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because CETIS was not able to run the Williams test on more than 10 treatment levels; the Williams test may have been more appropriate for the data.

The in-life portion of this study for onion, cabbage, cucumber, mustard, oilseed rape, radish, and tomato was February 19, 2016 to March 11, 2016, and for corn, oat, grain sorghum, wheat, buckwheat, soybean, and sunflower was March 1, 2016 to March 22, 2016.

F. CONCLUSIONS:

This study is scientifically sound and is classified as acceptable.

The upper treatment levels in several species produced unrealistically shallow dose response curves for survival. These shallow dose response curves, in-turn, yielded survival EC₀₅ estimates that were unrealistically low (several orders of magnitude below) relative observations at the lowest treatments levels in the studies. Consequently, for several species additional statistical analyses were performed, truncating the high mortalities from the data sets, and enabling more accurate determinations of sublethal effects endpoints at the lower portion of the dose progression.

The most sensitive monocot was onion based on biomass with NOAEC and EC₂₅ values of 0.36 and 0.372 lb 2,4-D Choline Salt/A, respectively. The most sensitive dicot was cabbage based on biomass with EC₀₅ and EC₂₅ values of 0.0381 and 0.122 lb 2,4-D Choline Salt/A, respectively.

Most sensitive monocot and EC₂₅: Onion (biomass, 0.372 lb 2,4-D Choline Salt/A)

Most sensitive dicot and EC₂₅: Cabbage (biomass 0.122 lb 2,4-D Choline Salt/A)

III. REFERENCES:

1. U.S. Environmental Protection Agency - 1982. Pesticide Assessment Guidelines. Subdivision J. Hazard Evaluation: Non-Target Plants; Series 123-1 Seed germination/seedling emergence and vegetative vigor (Tier 2).
2. U.S. Environmental Protection Agency, Series 850- Ecological Effects Test Guidelines, OCSPP Number 850.4100: Seedling Emergence and Seedling Growth. 2012.
3. Frans, R.E. and Talbert, R.E., Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama, 1977.

CETIS Summary Report

Report Date:

31 May-16 15:16 (p 1 of 4)

Test Code:

49903201 buckwh | 18-1573-6933

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 01-3170-5805	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date:	Species: Fagopyrum esculentum	Brine:
Duration: NA	Source: Johnny's Selected Seeds, ME	Age:
Sample ID: 13-4531-8845	Code: 49903201 buckwh	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date:	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Sample Note: 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-6084-3304	Mean Height	0.7	1.41	0.9935	12.4%		Dunnett Multiple Comparison Test
03-4999-6673	Mean Weight	1.41	>1.41	NA	19.6%		Dunnett Multiple Comparison Test
14-8243-2340	Percent Emerged	1.41	>1.41	NA	9.79%		Mann-Whitney U Two-Sample Test
06-4012-3756	Percent Survived	1.41	>1.41	NA	9.79%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ai/A	95% LCL	95% UCL	TU	Method
03-9829-6331	Mean Height	IC5	0.416	0.0788	0.879		Nonlinear Regression
		IC10	1.02	0.49	1.73		
		IC25	4.59	0.221	20.4		
		IC50	24.3	N/A	N/A		
05-1923-4460	Percent Emerged	EC5	0.0351	N/A	N/A		Linear Regression (MLE)
		EC10	87.7	N/A	N/A		
		EC25	41700000	N/A	N/A		
		EC50	84700000	N/A	N/A		
10-5002-6412	Percent Survived	EC5	0.0351	N/A	N/A		Linear Regression (MLE)
		EC10	87.7	N/A	N/A		
		EC25	41700000	N/A	N/A		
		EC50	84700000	N/A	N/A		

CETIS Summary Report
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Test Code:

49903201 buckwh | 18-1573-6933

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	447	406	488	409	518	16	39.1	8.75%	0.0%
0.00138		6	417	364	469	326	477	20.5	50.2	12.0%	6.82%
0.0027		6	422	362	482	336	482	23.5	57.6	13.6%	5.59%
0.0055		6	439	419	459	420	475	7.88	19.3	4.39%	1.75%
0.011		6	446	436	455	434	456	3.78	9.27	2.08%	0.3%
0.0221		6	427	388	466	358	459	15.2	37.3	8.73%	4.51%
0.044		6	431	389	474	380	476	16.5	40.4	9.37%	3.5%
0.083		6	446	411	482	399	498	13.8	33.7	7.56%	0.19%
0.179		6	425	383	466	376	472	16.2	39.7	9.35%	5.0%
0.35		6	399	358	440	357	452	15.9	39	9.76%	10.7%
0.7		6	409	374	445	358	448	13.8	33.7	8.24%	8.46%
1.41		6	380	346	413	358	444	13.1	32.1	8.46%	15.1%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.566	0.472	0.661	0.464	0.718	0.0369	0.0903	15.9%	0.0%
0.00138		6	0.475	0.434	0.515	0.403	0.519	0.0157	0.0385	8.11%	16.2%
0.0027		6	0.524	0.469	0.578	0.46	0.6	0.0211	0.0518	9.88%	7.52%
0.0055		6	0.61	0.543	0.676	0.538	0.723	0.026	0.0637	10.5%	-7.64%
0.011		6	0.537	0.481	0.592	0.468	0.615	0.0215	0.0527	9.82%	5.26%
0.0221		6	0.549	0.468	0.629	0.456	0.67	0.0313	0.0767	14.0%	3.12%
0.044		6	0.552	0.397	0.708	0.401	0.808	0.0605	0.148	26.8%	2.46%
0.083		6	0.583	0.527	0.639	0.541	0.686	0.0218	0.0533	9.15%	-2.97%
0.179		6	0.563	0.478	0.647	0.444	0.653	0.033	0.0809	14.4%	0.66%
0.35		6	0.561	0.488	0.634	0.456	0.63	0.0283	0.0694	12.4%	0.92%
0.7		6	0.575	0.509	0.64	0.511	0.684	0.0255	0.0625	10.9%	-1.48%
1.41		6	0.531	0.47	0.592	0.448	0.581	0.0238	0.0583	11.0%	6.21%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	0.0%
0.00138		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.0055		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.0221		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	0.0%
0.044		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.083		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.179		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.35		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.7		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
1.41		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	0.0%
0.00138		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.0055		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.0221		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	0.0%
0.044		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.083		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.179		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.35		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.7		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
1.41		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%

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Test Code:

49903201 buckwh | 18-1573-6933

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	443	518	461	409	429	422
0.00138		477	419	443	326	414	420
0.0027		336	482	460	369	458	427
0.0055		434	420	442	426	475	438
0.011		434	437	456	454	442	451
0.0221		459	443	358	452	413	436
0.044		448	473	476	415	380	396
0.083		469	399	436	437	498	438
0.179		432	377	452	439	376	472
0.35		368	371	452	428	420	357
0.7		379	418	424	428	448	358
1.41		444	358	368	364	367	377

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.613	0.718	0.556	0.551	0.496	0.464
0.00138		0.477	0.487	0.519	0.403	0.478	0.482
0.0027		0.554	0.541	0.476	0.6	0.511	0.46
0.0055		0.723	0.569	0.592	0.624	0.612	0.538
0.011		0.51	0.615	0.573	0.505	0.468	0.548
0.0221		0.591	0.532	0.486	0.557	0.456	0.67
0.044		0.808	0.632	0.53	0.401	0.443	0.501
0.083		0.686	0.575	0.591	0.541	0.554	0.553
0.179		0.566	0.444	0.642	0.571	0.5	0.653
0.35		0.63	0.456	0.497	0.613	0.574	0.598
0.7		0.574	0.563	0.521	0.596	0.511	0.684
1.41		0.574	0.572	0.544	0.469	0.448	0.581

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.714	1	1	1	1
0.00138		1	1	1	1	1	1
0.0027		1	1	1	0.857	1	1
0.0055		0.857	0.857	1	0.714	1	1
0.011		0.857	1	1	1	1	1
0.0221		1	1	1	1	1	0.714
0.044		0.714	0.857	1	1	1	0.857
0.083		1	1	0.857	0.857	1	1
0.179		1	1	0.857	0.857	0.714	1
0.35		0.857	1	1	1	1	1
0.7		1	0.857	1	0.857	1	0.857
1.41		1	0.857	1	1	0.857	1

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Test Code:

49903201 buckwh | 18-1573-6933

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.714	1	1	1	1
0.00138		1	1	1	1	1	1
0.0027		1	1	1	0.857	1	1
0.0055		0.857	0.857	1	0.714	1	1
0.011		0.857	1	1	1	1	1
0.0221		1	1	1	1	1	0.714
0.044		0.714	0.857	1	1	1	0.857
0.083		1	1	0.857	0.857	1	1
0.179		1	1	0.857	0.857	0.714	1
0.35		0.857	1	1	1	1	1
0.7		1	0.857	1	0.857	1	0.857
1.41		1	0.857	1	1	0.857	1

CETIS Summary Report

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Test Code:

49903201 cabbag | 10-3501-3444

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID:	10-6552-4336	Test Type:	Seedling Emergence Tier II	Analyst:	
Start Date:	19 Feb-16	Protocol:	OCSPP 850.4100 Plant Seedling Emergen	Diluent:	
Ending Date:	31 May-16 15:24	Species:	Brassica oleracea	Brine:	
Duration:	102d 15h	Source:	Sustainable Seed Co., CA	Age:	
Sample ID:	18-2052-6226	Code:	49903201 cabbag	Client:	CDM Smith - T. Nelis
Sample Date:	19 Feb-16	Material:	2,4-D choline salt	Project:	
Receive Date:	31 May-16 15:24	Source:	Dow AgroSciences		
Sample Age:	NA	Station:			

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-2560-4867	Mean Height	0.176	0.36	0.2517	NA		Jonckheere-Terpstra Step-Down Test
04-8614-7071	Mean Height	0.176	0.36	0.2517	18.6%		Dunnett Multiple Comparison Test
20-4305-1425	Mean Weight	0.176	0.36	0.2517	NA		Jonckheere-Terpstra Step-Down Test
14-8704-5059	Mean Weight	0.176	0.36	0.2517	28.7%		Mann-Whitney U Two-Sample Test
17-4204-4367	Percent Emerged	0.72	1.41	1.008	NA		Jonckheere-Terpstra Step-Down Test
05-8015-5517	Percent Emerged	0.36	0.72	0.5091	36.0%		Dunnett Multiple Comparison Test
00-5124-6316	Percent Survived	0.72	1.41	1.008	NA		Jonckheere-Terpstra Step-Down Test
00-3939-5941	Percent Survived	0.36	0.72	0.5091	35.9%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
20-6523-1317	Mean Height	IC5	0.0602	0.0257	0.0911		Nonlinear Regression
		IC10	0.102	0.0634	0.141		
		IC25	0.244	0.19	0.306		
		IC50	0.647	0.56	0.749		
04-7132-6225	Mean Weight	IC5	0.0309	N/A	0.0575		Nonlinear Regression
		IC10	0.0506	0.0187	0.0824		
		IC25	0.115	0.0727	0.168		
		IC50	0.288	0.223	0.372		
20-0565-3643	Percent Emerged	EC5	0.0000027	N/A	0.000294		Linear Regression (MLE)
		EC10	0.000111	N/A	0.00251		
		EC25	0.0534	0.00206	1.11		
		EC50	51.1	1.78	1E+10		
18-4043-6965	Percent Survived	EC5	0.0000036	N/A	0.000295		Linear Regression (MLE)
		EC10	0.000126	N/A	0.00242		
		EC25	0.0469	0.00246	0.513		
		EC50	33.8	1.57	1E+10		

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Test Code:

49903201 cabbag | 10-3501-3444

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	65.2	59.8	70.5	58	71	2.09	5.12	7.85%	0.0%
0.00138		6	71.3	66	76.7	64	78	2.09	5.13	7.18%	-9.46%
0.0027		6	67	60.1	73.9	58	75	2.7	6.6	9.86%	-2.81%
0.0055		6	70.8	61.2	80.5	58	85	3.76	9.22	13.0%	-8.7%
0.011		6	75.2	62.9	87.4	63	97	4.77	11.7	15.5%	-15.3%
0.0221		6	74.8	67.2	82.5	67	85	2.97	7.28	9.73%	-14.8%
0.044		6	73	60.2	85.8	60	92	4.98	12.2	16.7%	-12.0%
0.088		6	59.3	50.5	68.2	50	71	3.43	8.41	14.2%	8.95%
0.176		6	62.5	56.2	68.8	56	71	2.43	5.96	9.53%	4.09%
0.36		6	45.8	36.3	55.3	37	60	3.7	9.06	19.8%	29.7%
0.72		6	31	27.1	34.9	28	38	1.51	3.69	11.9%	52.4%
1.41		5	22.6	18.6	26.6	19	27	1.44	3.21	14.2%	65.3%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.0492	0.0357	0.0628	0.0336	0.0632	0.00527	0.0129	26.2%	0.0%
0.00138		6	0.0559	0.0392	0.0726	0.0391	0.0865	0.00651	0.0159	28.5%	-13.6%
0.0027		6	0.051	0.0395	0.0625	0.0389	0.0697	0.00447	0.011	21.5%	-3.7%
0.0055		6	0.0635	0.0491	0.078	0.0501	0.0849	0.00563	0.0138	21.7%	-29.1%
0.011		6	0.0643	0.0441	0.0844	0.0497	0.103	0.00784	0.0192	29.9%	-30.6%
0.0221		6	0.0636	0.0449	0.0823	0.04	0.0845	0.00728	0.0178	28.1%	-29.2%
0.044		6	0.0627	0.0469	0.0785	0.0487	0.0907	0.00614	0.015	24.0%	-27.3%
0.088		6	0.04	0.0263	0.0536	0.0277	0.062	0.00532	0.013	32.6%	18.8%
0.176		6	0.0383	0.0337	0.0429	0.0325	0.045	0.0018	0.00441	11.5%	22.2%
0.36		6	0.0246	0.0185	0.0307	0.0165	0.0309	0.00238	0.00583	23.7%	50.0%
0.72		5	0.0136	0.0118	0.0154	0.0116	0.0151	0.000648	0.00145	10.7%	72.4%
1.41		5	0.00841	0.00412	0.0127	0.003	0.0121	0.00155	0.00346	41.1%	82.9%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.881	0.768	0.994	0.714	1	0.0439	0.108	12.2%	0.0%
0.00138		6	0.81	0.655	0.964	0.571	1	0.0602	0.148	18.2%	8.11%
0.0027		6	0.833	0.658	1	0.571	1	0.0682	0.167	20.0%	5.41%
0.0055		6	0.833	0.658	1	0.571	1	0.0682	0.167	20.0%	5.41%
0.011		6	0.762	0.58	0.943	0.429	0.857	0.0706	0.173	22.7%	13.5%
0.0221		6	0.762	0.483	1	0.429	1	0.109	0.266	34.9%	13.5%
0.044		6	0.667	0.462	0.871	0.429	0.857	0.0797	0.195	29.3%	24.3%
0.088		6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	2.7%
0.176		6	0.857	0.668	1	0.571	1	0.0738	0.181	21.1%	2.7%
0.36		6	0.833	0.72	0.946	0.714	1	0.0439	0.108	12.9%	5.41%
0.72		6	0.524	0.125	0.922	0.143	1	0.155	0.38	72.5%	40.5%
1.41		6	0.524	0.161	0.887	0	0.857	0.141	0.346	66.1%	40.5%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.881	0.768	0.994	0.714	1	0.0439	0.108	12.2%	0.0%
0.00138		6	0.81	0.655	0.964	0.571	1	0.0602	0.148	18.2%	8.11%
0.0027		6	0.833	0.658	1	0.571	1	0.0682	0.167	20.0%	5.41%
0.0055		6	0.833	0.658	1	0.571	1	0.0682	0.167	20.0%	5.41%
0.011		6	0.762	0.58	0.943	0.429	0.857	0.0706	0.173	22.7%	13.5%
0.0221		6	0.762	0.483	1	0.429	1	0.109	0.266	34.9%	13.5%
0.044		6	0.667	0.462	0.871	0.429	0.857	0.0797	0.195	29.3%	24.3%
0.088		6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	2.7%
0.176		6	0.833	0.658	1	0.571	1	0.0682	0.167	20.0%	5.41%
0.36		6	0.81	0.687	0.932	0.714	1	0.0476	0.117	14.4%	8.11%
0.72		6	0.524	0.125	0.922	0.143	1	0.155	0.38	72.5%	40.5%
1.41		6	0.524	0.161	0.887	0	0.857	0.141	0.346	66.1%	40.5%

CETIS Summary Report

Report Date:

02 Jun-16 06:57 (p 3 of 4)

Test Code:

49903201 cabbag | 10-3501-3444

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	69	67	60	58	71	66
0.00138		76	71	64	71	68	78
0.0027		58	69	71	69	75	60
0.0055		73	58	69	85	75	65
0.011		68	63	74	73	97	76
0.0221		75	67	69	82	85	71
0.044		63	60	66	92	77	80
0.088		53	50	61	71	67	54
0.176		66	56	61	56	65	71
0.36		51	38	60	37	40	49
0.72		30	28	29	32	29	38
1.41		27		24	20	23	19

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.0556	0.0616	0.0461	0.0336	0.0632	0.0354
0.00138		0.0532	0.052	0.0516	0.053	0.0391	0.0865
0.0027		0.0544	0.0436	0.0538	0.0458	0.0697	0.0389
0.0055		0.0758	0.0501	0.0612	0.0849	0.054	0.0552
0.011		0.0497	0.0578	0.0557	0.0575	0.103	0.0624
0.0221		0.0837	0.0499	0.0625	0.0608	0.0845	0.04
0.044		0.0563	0.0487	0.0525	0.0907	0.0656	0.0623
0.088		0.0277	0.032	0.0441	0.062	0.0447	0.0294
0.176		0.045	0.0353	0.0394	0.0325	0.0408	0.0369
0.36		0.0309	0.0236	0.0301	0.0165	0.0194	0.0272
0.72		0.0147		0.0126	0.0151	0.0116	0.0139
1.41		0.0121		0.0104	0.00907	0.00755	0.003

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	1	0.857	0.714	0.857
0.00138		0.714	0.857	0.857	0.857	1	0.571
0.0027		0.571	1	1	0.857	0.714	0.857
0.0055		0.571	0.714	1	0.857	0.857	1
0.011		0.857	0.714	0.857	0.857	0.857	0.429
0.0221		0.429	1	1	1	0.571	0.571
0.044		0.429	0.857	0.429	0.714	0.714	0.857
0.088		1	0.857	0.571	0.857	1	0.857
0.176		1	1	0.714	1	0.571	0.857
0.36		0.857	0.714	0.714	1	0.857	0.857
0.72		1	0.143	0.143	0.286	0.714	0.857
1.41		0.714	0	0.857	0.429	0.857	0.286

CETIS Summary Report**Report Date:**

02 Jun-16 06:57 (p 4 of 4)

Test Code:

49903201 cabbag | 10-3501-3444

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	1	0.857	0.714	0.857
0.00138		0.714	0.857	0.857	0.857	1	0.571
0.0027		0.571	1	1	0.857	0.714	0.857
0.0055		0.571	0.714	1	0.857	0.857	1
0.011		0.857	0.714	0.857	0.857	0.857	0.429
0.0221		0.429	1	1	1	0.571	0.571
0.044		0.429	0.857	0.429	0.714	0.714	0.857
0.088		1	0.857	0.571	0.857	1	0.857
0.176		0.857	1	0.714	1	0.571	0.857
0.36		0.714	0.714	0.714	1	0.857	0.857
0.72		1	0.143	0.143	0.286	0.714	0.857
1.41		0.714	0	0.857	0.429	0.857	0.286

CETIS Summary Report**Report Date:**

31 May-16 17:08 (p 1 of 4)

Test Code:

49903201 corn | 18-4370-9453

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 19-4472-3065	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 31 May-16 16:56	Species: Zea mays	Brine:
Duration: 102d 17h	Source: Syngenta Seed Care	Age:
Sample ID: 12-4851-5489	Code: 49903201 corn	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 31 May-16 16:56	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-8288-9671	Mean Height	1.41	>1.41	NA	6.8%		Dunnett Multiple Comparison Test
06-0844-2332	Mean Weight	1.41	>1.41	NA	22.2%		Dunnett Multiple Comparison Test
09-4936-0554	Percent Emerged	1.41	>1.41	NA	4.66%		Mann-Whitney U Two-Sample Test
11-1819-2203	Percent Survived	1.41	>1.41	NA	4.98%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
19-8005-9857	Percent Emerged	EC5	0.0000755	N/A	N/A		Linear Regression (MLE)
		EC10	0.0000030	N/A	N/A		
		EC25	0.0000000	N/A	N/A		
		EC50	0.0000000	N/A	N/A		
17-9881-7374	Percent Survived	EC5	0.000367	N/A	N/A		Linear Regression (MLE)
		EC10	0.0000292	N/A	N/A		
		EC25	0.0000004	N/A	N/A		
		EC50	0.0000000	N/A	N/A		

CETIS Summary Report
Report Date:

31 May-16 17:08 (p 2 of 4)

Test Code:

49903201 corn | 18-4370-9453

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	652	635	668	634	670	6.32	15.5	2.38%	0.0%
0.00138		6	620	576	664	563	687	17.2	42.1	6.79%	4.86%
0.0027		6	644	622	666	624	673	8.6	21.1	3.27%	1.1%
0.0055		6	621	597	644	595	663	9.26	22.7	3.65%	4.73%
0.011		6	638	595	682	592	692	16.9	41.3	6.47%	2.02%
0.0221		6	652	614	690	586	680	14.7	36.1	5.54%	-0.03%
0.044		6	651	622	680	612	681	11.3	27.6	4.23%	0.08%
0.083		6	661	632	689	623	696	11.2	27.4	4.15%	-1.41%
0.179		6	648	607	689	580	680	15.9	39	6.01%	0.51%
0.35		6	674	649	698	656	713	9.51	23.3	3.46%	-3.38%
0.7		6	641	613	668	595	669	10.7	26.2	4.09%	1.69%
1.41		6	630	601	658	603	668	10.9	26.7	4.24%	3.38%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.599	0.524	0.674	0.461	0.663	0.0291	0.0713	11.9%	0.0%
0.00138		6	0.593	0.438	0.747	0.432	0.785	0.0602	0.148	24.9%	1.05%
0.0027		6	0.597	0.489	0.704	0.496	0.726	0.042	0.103	17.2%	0.37%
0.0055		6	0.621	0.542	0.701	0.543	0.754	0.0309	0.0756	12.2%	-3.76%
0.011		6	0.589	0.517	0.661	0.48	0.662	0.028	0.0687	11.7%	1.65%
0.0221		6	0.576	0.483	0.668	0.455	0.721	0.0361	0.0883	15.3%	3.85%
0.044		6	0.583	0.497	0.67	0.436	0.672	0.0336	0.0824	14.1%	2.57%
0.083		6	0.611	0.571	0.651	0.564	0.662	0.0157	0.0385	6.31%	-2.04%
0.179		6	0.602	0.507	0.696	0.437	0.673	0.0368	0.0901	15.0%	-0.48%
0.35		6	0.664	0.573	0.756	0.55	0.754	0.0356	0.0872	13.1%	-11.0%
0.7		6	0.591	0.475	0.706	0.424	0.739	0.045	0.11	18.7%	1.39%
1.41		6	0.604	0.514	0.694	0.507	0.75	0.035	0.0858	14.2%	-0.91%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.0027		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0055		6	1	1	1	1	1	0	0	0.0%	0.0%
0.011		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	4.76%
0.0221		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.044		6	1	1	1	1	1	0	0	0.0%	0.0%
0.083		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.179		6	1	1	1	1	1	0	0	0.0%	0.0%
0.35		6	1	1	1	1	1	0	0	0.0%	0.0%
0.7		6	1	1	1	1	1	0	0	0.0%	0.0%
1.41		6	1	1	1	1	1	0	0	0.0%	0.0%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.0055		6	1	1	1	1	1	0	0	0.0%	0.0%
0.011		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	4.76%
0.0221		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.044		6	1	1	1	1	1	0	0	0.0%	0.0%
0.083		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.179		6	1	1	1	1	1	0	0	0.0%	0.0%
0.35		6	1	1	1	1	1	0	0	0.0%	0.0%
0.7		6	1	1	1	1	1	0	0	0.0%	0.0%
1.41		6	1	1	1	1	1	0	0	0.0%	0.0%

CETIS Summary Report

Report Date:

31 May-16 17:08 (p 3 of 4)

Test Code:

49903201 corn | 18-4370-9453

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	670	659	634	666	637	643
0.00138		591	563	615	631	687	632
0.0027		626	631	666	624	673	646
0.0055		595	613	619	663	613	621
0.011		692	654	675	592	617	600
0.0221		586	677	680	664	669	634
0.044		681	669	627	645	672	612
0.083		645	696	684	670	646	623
0.179		623	669	673	664	680	580
0.35		656	657	713	691	663	661
0.7		655	595	652	669	645	627
1.41		650	638	668	614	604	603

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.639	0.6	0.461	0.605	0.625	0.663
0.00138		0.432	0.45	0.526	0.628	0.735	0.785
0.0027		0.586	0.519	0.496	0.531	0.726	0.721
0.0055		0.583	0.608	0.579	0.543	0.661	0.754
0.011		0.592	0.546	0.599	0.48	0.662	0.655
0.0221		0.455	0.526	0.593	0.56	0.721	0.599
0.044		0.569	0.571	0.436	0.641	0.672	0.611
0.083		0.572	0.564	0.608	0.643	0.618	0.662
0.179		0.573	0.602	0.437	0.658	0.673	0.668
0.35		0.562	0.55	0.694	0.695	0.732	0.754
0.7		0.546	0.424	0.576	0.575	0.683	0.739
1.41		0.626	0.507	0.634	0.557	0.552	0.75

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00138		1	1	1	1	0.857	1
0.0027		1	1	1	1	1	1
0.0055		1	1	1	1	1	1
0.011		1	1	1	1	0.714	1
0.0221		0.857	1	1	1	1	1
0.044		1	1	1	1	1	1
0.083		1	0.857	1	1	1	1
0.179		1	1	1	1	1	1
0.35		1	1	1	1	1	1
0.7		1	1	1	1	1	1
1.41		1	1	1	1	1	1

CETIS Summary Report**Report Date:**

31 May-16 17:08 (p 4 of 4)

Test Code:

49903201 corn | 18-4370-9453

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00138		1	1	1	1	0.857	1
0.0027		1	1	1	1	0.857	1
0.0055		1	1	1	1	1	1
0.011		1	1	1	1	0.714	1
0.0221		0.857	1	1	1	1	1
0.044		1	1	1	1	1	1
0.083		1	0.857	1	1	1	1
0.179		1	1	1	1	1	1
0.35		1	1	1	1	1	1
0.7		1	1	1	1	1	1
1.41		1	1	1	1	1	1

CETIS Summary Report

Report Date:

31 May-16 17:18 (p 1 of 4)

Test Code:

49903201 cucumb | 16-9760-3279

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID:	11-2407-9215	Test Type:	Seedling Emergence Tier II	Analyst:	
Start Date:	19 Feb-16	Protocol:	OCSPP 850.4100 Plant Seedling Emergen	Diluent:	
Ending Date:	31 May-16 17:10	Species:	Cucumis sativus	Brine:	
Duration:	102d 17h	Source:	NE Seed	Age:	
Sample ID:	09-8718-5524	Code:	49903201 cucumb	Client:	CDM Smith - T. Nelis
Sample Date:	19 Feb-16	Material:	2,4-D choline salt	Project:	
Receive Date:	31 May-16 17:10	Source:	Dow AgroSciences		
Sample Age:	NA	Station:			

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-6234-9072	Mean Height	1.41	>1.41	NA	16.3%		Dunnett Multiple Comparison Test
08-2609-8372	Mean Weight	1.41	>1.41	NA	20.2%		Dunnett Multiple Comparison Test
01-1400-6303	Percent Emerged	1.41	>1.41	NA	9.62%		Mann-Whitney U Two-Sample Test
15-3497-0595	Percent Survived	1.41	>1.41	NA	10.4%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
17-7885-8812	Mean Height	IC5	1.34	N/A	1.41		Nonlinear Regression
		IC10	1.4	1.25	1.47		
		IC25	1.51	1.43	1.58		
		IC50	1.64	1.59	1.69		
01-5333-3776	Percent Emerged	EC5	1.02	N/A	N/A		Linear Regression (MLE)
		EC10	1.59E-27	N/A	N/A		
		EC25	0	N/A	N/A		
		EC50	0	N/A	N/A		
16-8972-2133	Percent Survived	EC5	0.00238	N/A	N/A		Linear Regression (MLE)
		EC10	259	N/A	N/A		
		EC25	67800000	N/A	N/A		
		EC50	1.52E+20	N/A	N/A		

CETIS Summary Report
Report Date:

31 May-16 17:18 (p 2 of 4)

Test Code:

49903201 cucumb | 16-9760-3279

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	55	50.4	59.6	49	60	1.77	4.34	7.88%	0.0%
0.00138		6	54.3	46.5	62.2	43	64	3.05	7.47	13.8%	1.21%
0.0027		6	53.3	47	59.7	45	63	2.46	6.02	11.3%	3.03%
0.0055		6	51.7	44.6	58.8	45	63	2.76	6.77	13.1%	6.06%
0.011		6	57.5	52.2	62.8	48	62	2.08	5.09	8.85%	-4.55%
0.0221		6	60.7	56.1	65.2	52	64	1.78	4.37	7.2%	-10.3%
0.044		6	53.8	47.1	60.5	47	62	2.6	6.37	11.8%	2.12%
0.088		6	54	44.9	63.1	43	65	3.54	8.67	16.1%	1.82%
0.176		6	53.5	49.1	57.9	51	62	1.73	4.23	7.91%	2.73%
0.36		6	63.7	54.4	72.9	53	76	3.6	8.82	13.9%	-15.8%
0.72		6	57.8	52.6	63	51	64	2.02	4.96	8.57%	-5.15%
1.41		6	50	46.6	53.4	46	55	1.34	3.29	6.57%	9.09%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.195	0.174	0.215	0.17	0.22	0.00798	0.0195	10.0%	0.0%
0.00138		6	0.205	0.172	0.239	0.158	0.254	0.0129	0.0317	15.4%	-5.46%
0.0027		6	0.194	0.175	0.212	0.169	0.22	0.00727	0.0178	9.2%	0.61%
0.0055		6	0.179	0.144	0.214	0.149	0.234	0.0136	0.0334	18.6%	7.92%
0.011		6	0.192	0.158	0.226	0.164	0.243	0.0133	0.0326	17.0%	1.55%
0.0221		6	0.221	0.186	0.256	0.187	0.281	0.0137	0.0335	15.2%	-13.3%
0.044		6	0.212	0.192	0.231	0.189	0.24	0.00759	0.0186	8.79%	-8.62%
0.088		6	0.194	0.17	0.218	0.17	0.23	0.00922	0.0226	11.7%	0.43%
0.176		6	0.196	0.162	0.231	0.161	0.258	0.0134	0.0328	16.7%	-0.68%
0.36		6	0.223	0.199	0.247	0.204	0.265	0.00925	0.0227	10.2%	-14.4%
0.72		6	0.182	0.153	0.211	0.145	0.217	0.0114	0.028	15.4%	6.54%
1.41		6	0.166	0.144	0.188	0.139	0.199	0.00857	0.021	12.6%	14.7%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.905	0.827	0.982	0.857	1	0.0301	0.0738	8.15%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0027		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	-2.63%
0.0055		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	-2.63%
0.011		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-5.26%
0.0221		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.044		6	0.881	0.706	1	0.571	1	0.0682	0.167	19.0%	2.63%
0.088		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.176		6	1	1	1	1	1	0	0	0.0%	-10.5%
0.36		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	5.26%
0.72		6	1	1	1	1	1	0	0	0.0%	-10.5%
1.41		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-5.26%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.905	0.827	0.982	0.857	1	0.0301	0.0738	8.15%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0027		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	-2.63%
0.0055		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	-2.63%
0.011		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-5.26%
0.0221		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.044		6	0.881	0.706	1	0.571	1	0.0682	0.167	19.0%	2.63%
0.088		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.176		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-5.26%
0.36		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	5.26%
0.72		6	1	1	1	1	1	0	0	0.0%	-10.5%
1.41		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	0.0%

CETIS Summary Report

Report Date:

31 May-16 17:18 (p 3 of 4)

Test Code:

49903201 cucumb | 16-9760-3279

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	60	55	53	49	60	53
0.00138		51	61	53	54	64	43
0.0027		54	51	51	63	56	45
0.0055		48	46	54	45	54	63
0.011		59	62	48	59	61	56
0.0221		52	61	62	62	63	64
0.044		62	49	49	47	56	60
0.088		59	43	46	51	60	65
0.176		62	53	51	51	52	52
0.36		76	56	53	60	67	70
0.72		56	54	51	61	64	61
1.41		46	50	47	55	50	52

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.216	0.22	0.17	0.181	0.189	0.192
0.00138		0.217	0.212	0.192	0.201	0.254	0.158
0.0027		0.198	0.193	0.169	0.22	0.202	0.18
0.0055		0.15	0.158	0.19	0.149	0.196	0.234
0.011		0.22	0.167	0.164	0.171	0.185	0.243
0.0221		0.199	0.281	0.231	0.207	0.219	0.187
0.044		0.24	0.2	0.202	0.189	0.214	0.225
0.088		0.23	0.174	0.17	0.185	0.208	0.197
0.176		0.258	0.181	0.186	0.201	0.161	0.19
0.36		0.265	0.214	0.205	0.225	0.223	0.204
0.72		0.208	0.157	0.183	0.217	0.182	0.145
1.41		0.199	0.139	0.166	0.149	0.174	0.17

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.857	0.857	1	0.857
0.00138		1	1	1	0.857	1	1
0.0027		1	0.857	1	1	0.857	0.857
0.0055		0.857	1	0.857	1	0.857	1
0.011		1	1	1	0.857	1	0.857
0.0221		1	0.857	1	1	1	1
0.044		0.857	0.571	1	1	0.857	1
0.088		0.857	1	1	1	1	1
0.176		1	1	1	1	1	1
0.36		1	0.857	1	0.714	0.714	0.857
0.72		1	1	1	1	1	1
1.41		1	1	1	1	0.857	0.857

CETIS Summary Report**Report Date:**

31 May-16 17:18 (p 4 of 4)

Test Code:

49903201 cucumb | 16-9760-3279

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.857	0.857	1	0.857
0.00138		1	1	1	0.857	1	1
0.0027		1	0.857	1	1	0.857	0.857
0.0055		0.857	1	0.857	1	0.857	1
0.011		1	1	1	0.857	1	0.857
0.0221		1	0.857	1	1	1	1
0.044		0.857	0.571	1	1	0.857	1
0.088		0.857	1	1	1	1	1
0.176		1	1	1	0.857	0.857	1
0.36		1	0.857	1	0.714	0.714	0.857
0.72		1	1	1	1	1	1
1.41		0.857	1	1	1	0.857	0.714

CETIS Summary Report

Report Date:

01 Jun-16 14:23 (p 1 of 4)

Test Code:

49903201 mustar | 02-9430-7491

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID:	06-0789-9106	Test Type:	Seedling Emergence Tier II	Analyst:	
Start Date:	19 Feb-16	Protocol:	OCSPP 850.4100 Plant Seedling Emergen	Diluent:	
Ending Date:	01 Jun-16 14:09	Species:	Sinapis alba	Brine:	
Duration:	103d 14h	Source:	Johnny's Selected Seeds, ME	Age:	
Sample ID:	04-6342-1213	Code:	49903201 mustar	Client:	CDM Smith - T. Nelis
Sample Date:	19 Feb-16	Material:	2,4-D choline salt	Project:	
Receive Date:	01 Jun-16 14:09	Source:	Dow AgroSciences		
Sample Age:	NA	Station:			

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-6914-2207	Mean Height	0.176	0.36	0.2517	NA		Jonckheere-Terpstra Step-Down Test
14-7068-1456	Mean Height	0.36	0.72	0.5091	24.9%		Dunnett Multiple Comparison Test
18-5163-8248	Mean Weight	0.176	0.36	0.2517	NA		Jonckheere-Terpstra Step-Down Test
09-1961-8442	Mean Weight	0.176	0.36	0.2517	34.6%		Mann-Whitney U Two-Sample Test
07-0921-4353	Percent Emerged	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
17-4703-4788	Percent Emerged	0.36	0.72	0.5091	14.7%		Mann-Whitney U Two-Sample Test
06-1320-8292	Percent Survived	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
10-3513-2993	Percent Survived	0.36	0.72	0.5091	15.5%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
19-0248-6209	Mean Height	IC5	0.0851	N/A	0.142		Nonlinear Regression
		IC10	0.137	0.0633	0.209		
		IC25	0.303	0.211	0.41		
		IC50	0.732	0.603	0.887		
16-3876-3002	Mean Weight	IC5	0.0446	N/A	0.112		Nonlinear Regression
		IC10	0.0784	N/A	0.171		
		IC25	0.201	0.089	0.364		
		IC50	0.574	0.386	0.851		
14-6139-2251	Percent Emerged	EC5	0.00648	0.000186	0.0246		Linear Regression (MLE)
		EC10	0.0456	0.00789	0.138		
		EC25	1.19	0.335	30.3		
		EC50	44.4	4.45	59000		
02-3246-1193	Percent Survived	EC5	0.00667	0.000253	0.0241		Linear Regression (MLE)
		EC10	0.041	0.00733	0.116		
		EC25	0.851	0.271	11.9		
		EC50	24.8	3.22	9510		

CETIS Summary Report
Report Date:

01 Jun-16 14:23 (p 2 of 4)

Test Code:

49903201 mustar | 02-9430-7491

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	112	100	124	100	132	4.49	11	9.83%	0.0%
0.00138		6	115	93.9	135	84	146	8.07	19.8	17.2%	-2.38%
0.0027		6	137	116	158	108	156	8.01	19.6	14.3%	-22.3%
0.0055		6	113	90.8	134	89	143	8.43	20.7	18.4%	-0.45%
0.011		6	130	102	158	100	164	11	27	20.8%	-15.9%
0.0221		6	131	109	152	104	156	8.46	20.7	15.9%	-16.5%
0.044		6	125	109	140	106	146	6.07	14.9	11.9%	-11.5%
0.088		6	106	93.7	119	93	124	4.86	11.9	11.2%	5.21%
0.176		6	104	87.3	120	86	128	6.35	15.6	15.0%	7.44%
0.36		6	95.7	68.6	123	72	145	10.5	25.8	26.9%	14.6%
0.72		6	55.8	34.1	77.6	33	80	8.46	20.7	37.1%	50.1%
1.41		6	39	26	52	17	52	5.04	12.3	31.7%	65.2%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.0564	0.0329	0.0799	0.0422	0.101	0.00915	0.0224	39.7%	0.0%
0.00138		6	0.053	0.0362	0.0699	0.0358	0.0832	0.00656	0.0161	30.3%	5.97%
0.0027		6	0.0723	0.0473	0.0973	0.0421	0.101	0.00972	0.0238	32.9%	-28.2%
0.0055		6	0.0517	0.032	0.0714	0.0362	0.0845	0.00767	0.0188	36.3%	8.37%
0.011		6	0.0637	0.0319	0.0955	0.0339	0.107	0.0124	0.0303	47.6%	-12.9%
0.0221		6	0.0645	0.0429	0.086	0.0491	0.103	0.00839	0.0206	31.9%	-14.3%
0.044		6	0.0572	0.0392	0.0753	0.0386	0.085	0.00704	0.0172	30.1%	-1.47%
0.088		6	0.0442	0.0365	0.0519	0.0369	0.056	0.00299	0.00733	16.6%	21.7%
0.176		6	0.0439	0.0352	0.0525	0.0309	0.0553	0.00337	0.00826	18.8%	22.3%
0.36		6	0.0456	0.0193	0.0719	0.0266	0.0953	0.0102	0.0251	55.0%	19.2%
0.72		6	0.0237	0.014	0.0335	0.012	0.0352	0.00378	0.00927	39.1%	57.9%
1.41		6	0.0163	0.0118	0.0209	0.00885	0.0207	0.00176	0.00431	26.4%	71.0%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.00138		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.0055		6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	7.69%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.0221		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	-2.56%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.088		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%
0.176		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.36		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%
0.72		6	0.714	0.525	0.904	0.571	1	0.0738	0.181	25.3%	23.1%
1.41		6	0.595	0.337	0.853	0.286	1	0.1	0.246	41.3%	35.9%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.00138		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.0055		6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	7.69%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.0221		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	-2.56%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.088		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%
0.176		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%
0.36		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%
0.72		6	0.714	0.525	0.904	0.571	1	0.0738	0.181	25.3%	23.1%
1.41		6	0.548	0.257	0.839	0.286	1	0.113	0.277	50.6%	41.0%

CETIS Summary Report

Report Date:

01 Jun-16 14:23 (p 3 of 4)

Test Code:

49903201 mustar | 02-9430-7491

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	115	100	106	108	111	132
0.00138		118	110	84	115	146	115
0.0027		154	108	144	142	118	156
0.0055		89	98	101	130	114	143
0.011		100	161	121	107	126	164
0.0221		111	104	135	150	127	156
0.044		121	126	113	106	137	146
0.088		104	108	114	93	94	124
0.176		94	128	86	96	116	102
0.36		90	72	80	89	98	145
0.72		74	69	38	80	33	41
1.41		38	37	17	49	52	41

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.0502	0.0427	0.0422	0.0467	0.0556	0.101
0.00138		0.0468	0.0471	0.0358	0.0507	0.0832	0.0547
0.0027		0.101	0.0421	0.0817	0.0671	0.0487	0.0935
0.0055		0.0362	0.0417	0.0369	0.0626	0.0484	0.0845
0.011		0.0339	0.107	0.0556	0.0384	0.0521	0.095
0.0221		0.0518	0.0491	0.0607	0.0697	0.052	0.103
0.044		0.0608	0.0618	0.0389	0.0386	0.0584	0.085
0.088		0.0385	0.0472	0.0472	0.0369	0.0391	0.056
0.176		0.0309	0.0553	0.0399	0.0475	0.0472	0.0424
0.36		0.0429	0.0266	0.0353	0.0322	0.0411	0.0953
0.72		0.0352	0.0236	0.012	0.034	0.0209	0.0168
1.41		0.0207	0.0172	0.00885	0.0184	0.019	0.0139

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	0.857	1	1	0.714
0.00138		1	1	0.857	1	1	0.714
0.0027		0.857	1	1	1	1	1
0.0055		0.857	1	0.857	1	0.571	0.857
0.011		1	1	0.857	1	1	1
0.0221		0.714	1	1	1	1	1
0.044		1	1	1	1	0.857	1
0.088		1	1	0.857	1	0.714	0.857
0.176		1	0.857	1	0.857	0.857	1
0.36		0.714	0.857	1	1	1	0.857
0.72		0.571	1	0.857	0.714	0.571	0.571
1.41		0.429	0.286	0.571	0.571	1	0.714

CETIS Summary Report**Report Date:**

01 Jun-16 14:23 (p 4 of 4)

Test Code:

49903201 mustar | 02-9430-7491

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	0.857	1	1	0.714
0.00138		1	1	0.857	1	1	0.714
0.0027		0.857	1	1	1	1	1
0.0055		0.857	1	0.857	1	0.571	0.857
0.011		1	1	0.857	1	1	1
0.0221		0.714	1	1	1	1	1
0.044		1	1	1	1	0.857	1
0.088		1	1	0.857	1	0.714	0.857
0.176		1	0.714	1	0.857	0.857	1
0.36		0.714	0.857	1	1	1	0.857
0.72		0.571	1	0.857	0.714	0.571	0.571
1.41		0.429	0.286	0.286	0.571	1	0.714

CETIS Summary Report

Report Date:

31 May-16 17:28 (p 1 of 4)

Test Code:

49903201 oat | 05-3766-4964

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 17-4864-9263	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 31 May-16 17:19	Species: Avena sativa	Brine:
Duration: 102d 17h	Source: L.A. Hearne Company	Age:
Sample ID: 18-7250-1506	Code: 49903201 oat	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 31 May-16 17:19	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-6896-2231	Mean Height	0.7	1.41	0.9935	NA		Jonckheere-Terpstra Step-Down Test
05-7626-9078	Mean Height	0.7	1.41	0.9935	8.19%		Mann-Whitney U Two-Sample Test
03-8923-2444	Mean Weight	1.41	>1.41	NA	31.5%		Dunnett Multiple Comparison Test
09-8382-7279	Percent Emerged	1.41	>1.41	NA	9.22%		Mann-Whitney U Two-Sample Test
05-2724-2288	Percent Survived	1.41	>1.41	NA	9.26%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ai/A	95% LCL	95% UCL	TU	Method
05-8309-6634	Mean Height	IC5	0.673	0.137	1.08		Nonlinear Regression
		IC10	1.1	0.737	1.46		
		IC25	2.48	0.859	4.81		
		IC50	6.13	0.459	81.8		
15-1160-8710	Mean Weight	IC5	0.648	N/A	1.51		Nonlinear Regression
		IC10	0.982	N/A	1.77		
		IC25	1.97	N/A	5.2		
		IC50	4.25	N/A	N/A		
01-8192-1665	Percent Emerged	EC5	863	N/A	N/A		Linear Regression (MLE)
		EC10	3.75E-18	N/A	N/A		
		EC25	0	N/A	N/A		
		EC50	0	N/A	N/A		
16-0139-4534	Percent Survived	EC5	4.57	N/A	N/A		Linear Regression (MLE)
		EC10	0.0000000	N/A	N/A		
		EC25	5.51E-21	N/A	N/A		
		EC50	1.59E-35	N/A	N/A		

CETIS Summary Report
Report Date:

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Test Code:

49903201 oat | 05-3766-4964

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	453	422	485	411	489	12.3	30	6.63%	0.0%
0.00138		6	436	410	461	409	479	10	24.6	5.65%	3.86%
0.0027		6	439	396	482	376	476	16.9	41.4	9.43%	3.13%
0.0055		6	449	390	508	345	493	22.9	56	12.5%	0.96%
0.011		6	463	432	495	420	503	12.2	29.8	6.43%	-2.24%
0.0221		6	450	415	484	391	481	13.5	33.1	7.37%	0.81%
0.044		6	454	414	493	397	494	15.3	37.4	8.25%	-0.07%
0.083		6	452	409	494	388	487	16.4	40.3	8.92%	0.33%
0.179		6	449	420	478	414	491	11.2	27.5	6.13%	0.88%
0.35		6	424	397	451	385	458	10.5	25.7	6.06%	6.36%
0.7		6	436	399	473	388	481	14.5	35.6	8.17%	3.79%
1.41		6	385	351	419	344	423	13.2	32.4	8.43%	15.1%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.162	0.134	0.19	0.116	0.186	0.0109	0.0267	16.5%	0.0%
0.00138		6	0.157	0.128	0.187	0.122	0.207	0.0114	0.0279	17.7%	3.06%
0.0027		6	0.155	0.119	0.19	0.109	0.188	0.0139	0.034	22.0%	4.73%
0.0055		6	0.176	0.124	0.227	0.0862	0.219	0.02	0.049	27.9%	-8.42%
0.011		6	0.175	0.139	0.21	0.133	0.209	0.0138	0.0339	19.4%	-7.84%
0.0221		6	0.164	0.132	0.196	0.11	0.191	0.0123	0.0302	18.4%	-1.18%
0.044		6	0.175	0.127	0.222	0.117	0.235	0.0185	0.0453	25.9%	-7.66%
0.083		6	0.167	0.127	0.207	0.1	0.211	0.0156	0.0381	22.9%	-2.69%
0.179		6	0.165	0.14	0.19	0.133	0.204	0.00963	0.0236	14.3%	-1.82%
0.35		6	0.154	0.131	0.176	0.117	0.171	0.00877	0.0215	14.0%	5.09%
0.7		6	0.162	0.127	0.196	0.117	0.197	0.0134	0.0328	20.3%	0.28%
1.41		6	0.137	0.0916	0.182	0.0888	0.196	0.0176	0.0431	31.5%	15.6%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.00138		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%
0.0027		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.0055		6	0.905	0.827	0.982	0.857	1	0.0301	0.0738	8.15%	2.56%
0.011		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.0221		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.083		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%
0.179		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.35		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.7		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%
1.41		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.00138		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.0027		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.0055		6	0.905	0.827	0.982	0.857	1	0.0301	0.0738	8.15%	2.56%
0.011		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.0221		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.083		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%
0.179		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.35		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.7		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%
1.41		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%

CETIS Summary Report

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OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	426	411	479	489	460	454
0.00138		409	435	445	419	427	479
0.0027		403	439	376	476	467	473
0.0055		345	425	493	480	479	471
0.011		456	420	447	503	489	465
0.0221		391	481	435	451	475	464
0.044		425	397	481	477	494	447
0.083		388	416	483	487	471	465
0.179		414	447	465	426	491	452
0.35		385	431	438	458	429	405
0.7		388	423	416	481	474	434
1.41		365	395	363	344	419	423

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.116	0.15	0.174	0.185	0.163	0.186
0.00138		0.122	0.151	0.161	0.146	0.157	0.207
0.0027		0.121	0.147	0.109	0.184	0.178	0.188
0.0055		0.0862	0.156	0.208	0.187	0.2	0.219
0.011		0.141	0.133	0.162	0.204	0.209	0.2
0.0221		0.11	0.16	0.154	0.191	0.186	0.183
0.044		0.117	0.128	0.173	0.198	0.235	0.197
0.083		0.1	0.154	0.166	0.192	0.176	0.211
0.179		0.133	0.159	0.172	0.154	0.204	0.168
0.35		0.117	0.138	0.163	0.171	0.168	0.166
0.7		0.117	0.143	0.139	0.197	0.184	0.191
1.41		0.0888	0.116	0.126	0.11	0.184	0.196

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.857	1	1	0.857
0.00138		1	0.857	1	1	1	0.857
0.0027		1	0.857	0.857	1	1	0.857
0.0055		0.857	1	0.857	1	0.857	0.857
0.011		1	1	0.714	0.857	1	1
0.0221		1	0.857	1	0.857	1	1
0.044		1	1	1	1	0.857	1
0.083		1	1	1	1	0.857	0.857
0.179		1	0.857	1	1	0.857	0.857
0.35		1	1	1	0.857	1	1
0.7		1	1	0.857	1	0.857	1
1.41		0.857	1	0.857	1	0.714	1

CETIS Summary Report**Report Date:**

31 May-16 17:28 (p 4 of 4)

Test Code:

49903201 oat | 05-3766-4964

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.857	1	1	0.857
0.00138		1	0.857	0.857	1	1	0.857
0.0027		1	0.857	0.857	1	1	0.857
0.0055		0.857	1	0.857	1	0.857	0.857
0.011		1	1	0.714	0.857	1	1
0.0221		1	0.857	1	0.857	1	1
0.044		1	1	1	1	0.857	1
0.083		1	1	1	1	0.857	0.857
0.179		1	0.857	1	1	0.857	0.857
0.35		1	1	1	0.857	1	1
0.7		1	1	0.857	1	0.857	1
1.41		0.857	1	0.857	1	0.714	1

CETIS Summary Report**Report Date:**

02 Jun-16 07:04 (p 1 of 4)

Test Code:

49903201 oilsee | 15-2522-4173

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 13-0058-7025	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 31 May-16 17:30	Species: Brassica napus	Brine:
Duration: 102d 17h	Source: Johnny's Selected Seeds, ME	Age:
Sample ID: 11-2895-0857	Code: 49903201 oilsee	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 31 May-16 17:30	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
01-5956-2633	Mean Height	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
18-1822-8245	Mean Height	1.41	>1.41	NA	25.3%		Dunnett Multiple Comparison Test
19-8991-8605	Mean Weight	0.176	0.36	0.2517	NA		Jonckheere-Terpstra Step-Down Test
08-3223-8182	Mean Weight	0.36	0.72	0.5091	37.2%		Mann-Whitney U Two-Sample Test
01-7223-2601	Percent Emerged	1.41	>1.41	NA	9.06%		Mann-Whitney U Two-Sample Test
12-2649-5989	Percent Survived	1.41	>1.41	NA	9.1%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
18-8513-2391	Mean Height	IC5	0.0133	N/A	0.0945		Nonlinear Regression
		IC10	0.0781	0.00741	0.324		
		IC25	1.5	0.226	6.63		
		IC50	39.9	0.114	14000		
11-7202-2506	Mean Weight	IC5	0.0713	0.0132	0.247		Nonlinear Regression
		IC10	0.13	0.0347	0.384		
		IC25	0.611	0.201	1.75		
		IC50	6.95	0.661	229		
14-6804-3835	Percent Survived	EC5	0.148	N/A	N/A		Linear Regression (MLE)
		EC10	5130000	N/A	N/A		
		EC25	2.04E+19	N/A	N/A		
		EC50	2.03E+33	N/A	N/A		

CETIS Summary Report
Report Date:

02 Jun-16 07:04 (p 2 of 4)

Test Code:

49903201 oilsee | 15-2522-4173

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	83.7	70.9	96.5	64	102	4.98	12.2	14.6%	0.0%
0.00138		6	108	91.4	124	82	124	6.39	15.7	14.5%	-28.9%
0.0027		6	73	53.8	92.2	56	107	7.46	18.3	25.0%	12.7%
0.0055		6	96.8	81.3	112	76	110	6.04	14.8	15.3%	-15.7%
0.011		6	72.3	53.8	90.9	55	99	7.22	17.7	24.4%	13.5%
0.0221		6	79.3	60.3	98.3	58	105	7.39	18.1	22.8%	5.18%
0.044		6	76.7	66.2	87.2	67	94	4.08	9.99	13.0%	8.37%
0.088		6	80.5	65.9	95.1	64	103	5.66	13.9	17.2%	3.78%
0.176		6	84.2	77.2	91.1	72	90	2.7	6.62	7.86%	-0.6%
0.36		6	75	56.4	93.6	50	102	7.24	17.7	23.7%	10.4%
0.72		6	69.5	59.4	79.6	54	81	3.92	9.61	13.8%	16.9%
1.41		6	65.7	51.9	79.4	49	87	5.34	13.1	19.9%	21.5%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.0492	0.0369	0.0615	0.0339	0.0702	0.00477	0.0117	23.8%	0.0%
0.00138		6	0.0882	0.0471	0.129	0.0464	0.134	0.016	0.0392	44.4%	-79.3%
0.0027		6	0.0398	0.0227	0.057	0.0289	0.0726	0.00667	0.0163	41.1%	19.1%
0.0055		6	0.0677	0.048	0.0874	0.0445	0.0881	0.00765	0.0187	27.7%	-37.6%
0.011		6	0.0392	0.0274	0.0511	0.0277	0.0577	0.00461	0.0113	28.8%	20.3%
0.0221		6	0.0476	0.0243	0.0709	0.0274	0.0877	0.00906	0.0222	46.6%	3.22%
0.044		6	0.0431	0.0376	0.0486	0.0378	0.0522	0.00212	0.0052	12.1%	12.4%
0.088		6	0.0463	0.0318	0.0607	0.0283	0.0663	0.00562	0.0138	29.8%	6.0%
0.176		6	0.045	0.0381	0.0518	0.0349	0.0516	0.00266	0.00652	14.5%	8.6%
0.36		6	0.0412	0.0211	0.0612	0.0214	0.0756	0.00779	0.0191	46.4%	16.4%
0.72		6	0.0324	0.0264	0.0384	0.0256	0.0396	0.00233	0.00571	17.6%	34.1%
1.41		6	0.0282	0.0175	0.039	0.0147	0.0448	0.0042	0.0103	36.4%	42.6%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.00138		6	0.881	0.768	0.994	0.714	1	0.0439	0.108	12.2%	5.13%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.0055		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	-2.56%
0.011		6	1	1	1	1	1	0	0	0.0%	-7.69%
0.0221		6	1	1	1	1	1	0	0	0.0%	-7.69%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.088		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.176		6	1	1	1	1	1	0	0	0.0%	-7.69%
0.36		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%
0.72		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
1.41		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-2.56%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
0.00138		6	0.881	0.768	0.994	0.714	1	0.0439	0.108	12.2%	5.13%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.0055		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	-2.56%
0.011		6	1	1	1	1	1	0	0	0.0%	-7.69%
0.0221		6	1	1	1	1	1	0	0	0.0%	-7.69%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-5.13%
0.088		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	0.0%
0.176		6	1	1	1	1	1	0	0	0.0%	-7.69%
0.36		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	2.56%
0.72		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%
1.41		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	0.0%

CETIS Summary Report

Report Date:

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Test Code:

49903201 oilsee | 15-2522-4173

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	64	81	83	87	85	102
0.00138		82	103	114	122	102	124
0.0027		56	68	59	75	107	73
0.0055		106	109	99	76	110	81
0.011		64	55	57	71	99	88
0.0221		105	72	58	63	86	92
0.044		67	71	70	94	76	82
0.088		78	69	64	87	82	103
0.176		90	72	87	85	82	89
0.36		50	62	102	76	80	80
0.72		64	71	54	77	70	81
1.41		58	64	63	73	49	87

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.0339	0.0495	0.0474	0.0472	0.0471	0.0702
0.00138		0.134	0.0528	0.132	0.0642	0.101	0.0464
0.0027		0.0289	0.0333	0.0311	0.0371	0.0726	0.0359
0.0055		0.081	0.0881	0.068	0.0455	0.0792	0.0445
0.011		0.0383	0.0277	0.0312	0.0332	0.0577	0.0471
0.0221		0.0877	0.0384	0.0295	0.0274	0.0528	0.0499
0.044		0.0395	0.0378	0.0439	0.0522	0.0403	0.0449
0.088		0.0439	0.0408	0.0283	0.0583	0.0399	0.0663
0.176		0.0495	0.0349	0.0516	0.0423	0.0414	0.0501
0.36		0.0214	0.0298	0.0756	0.0361	0.0487	0.0354
0.72		0.0257	0.0332	0.0256	0.0365	0.0396	0.0339
1.41		0.0216	0.0283	0.0268	0.0333	0.0147	0.0448

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	0.857	0.857	1	0.857
0.00138		0.857	1	0.714	1	0.857	0.857
0.0027		1	1	1	1	0.857	1
0.0055		0.714	1	1	1	1	1
0.011		1	1	1	1	1	1
0.0221		1	1	1	1	1	1
0.044		1	1	0.857	1	1	1
0.088		0.714	1	1	0.857	1	1
0.176		1	1	1	1	1	1
0.36		0.857	1	1	1	0.857	0.714
0.72		0.857	0.857	1	1	1	0.857
1.41		0.857	0.857	1	1	1	1

CETIS Summary Report**Report Date:**

02 Jun-16 07:04 (p 4 of 4)

Test Code:

49903201 oilsee | 15-2522-4173

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.857	1	0.857	
0.00138		0.857	1	0.714	1	0.857	0.857
0.0027		1	1	1	1	0.857	1
0.0055		0.714	1	1	1	1	1
0.011		1	1	1	1	1	1
0.0221		1	1	1	1	1	1
0.044		1	1	0.857	1	1	1
0.088		0.714	1	1	0.857	1	1
0.176		1	1	1	1	1	1
0.36		0.857	1	1	1	0.857	0.714
0.72		0.857	0.857	1	1	1	0.857
1.41		0.857	0.857	1	1	0.857	1

CETIS Summary Report**Report Date:**

02 Jun-16 17:58 (p 1 of 4)

Test Code:

49903201 onion | 11-6506-7627

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 19-8991-8605	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 31 May-16 17:43	Species: Allium cepa	Brine:
Duration: 102d 18h	Source: Park Seed Co.	Age:
Sample ID: 04-2560-3276	Code: 49903201 onion	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 31 May-16 17:43	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-3010-3774	Mean Height	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
00-3369-0656	Mean Height	0.176	0.36	0.2517	21.9%		Dunnett Multiple Comparison Test
07-5423-8613	Mean Weight	0.72	1.41	1.008	NA		Jonckheere-Terpstra Step-Down Test
03-9251-2370	Mean Weight	0.72	1.41	1.008	37.6%		Dunnett Multiple Comparison Test
10-7044-0480	Percent Emerged	0.72	1.41	1.008	NA		Jonckheere-Terpstra Step-Down Test
18-9297-2940	Percent Emerged	1.41	>1.41	NA	26.9%		Dunnett Multiple Comparison Test
16-4422-8764	Percent Survived	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
06-1718-3648	Percent Survived	0.36	0.72	0.5091	19.7%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
14-1066-0207	Mean Height	IC5	0.158	N/A	0.297		Nonlinear Regression
		IC10	0.274	0.102	0.458		
		IC25	0.683	0.487	0.915		
		IC50	1.88	1.2	2.96		
14-5371-0684	Mean Weight	IC5	0.26	N/A	0.53		Nonlinear Regression
		IC10	0.387	N/A	0.725		
		IC25	0.752	0.433	1.13		
		IC50	1.57	0.984	2.51		
01-7960-0488	Percent Emerged	EC5	0.0000000	N/A	8.12E-05		Linear Regression (MLE)
		EC10	0.0000378	N/A	0.00191		
		EC25	0.82	0.0896	1E+10		
		EC50	54000	47.7	1E+10		
15-3891-6179	Percent Survived	EC5	0.0000031	N/A	0.000151		Linear Regression (MLE)
		EC10	0.000143	N/A	0.00175		
		EC25	0.0832	0.0186	0.587		
		EC50	98.3	4.78	15400000		

CETIS Summary Report
Report Date:

02 Jun-16 17:58 (p 2 of 4)

Test Code:

49903201 onion | 11-6506-7627

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	77.2	63.9	90.4	60	98	5.15	12.6	16.3%	0.0%
0.00138		6	72.3	60.1	84.6	63	94	4.77	11.7	16.1%	6.26%
0.0027		6	74.7	64.7	84.7	61	89	3.89	9.52	12.8%	3.24%
0.0055		6	79.3	68.3	90.4	66	98	4.29	10.5	13.3%	-2.81%
0.011		6	75.5	67	84	60	82	3.3	8.09	10.7%	2.16%
0.0221		6	70.2	63.2	77.1	63	79	2.7	6.62	9.43%	9.07%
0.044		6	77.8	69.2	86.5	69	91	3.37	8.26	10.6%	-0.86%
0.088		6	74.2	63.4	85	64	87	4.21	10.3	13.9%	3.89%
0.176		6	78.2	62.6	93.8	67	105	6.06	14.9	19.0%	-1.3%
0.36		6	59.8	37.6	82.1	23	82	8.66	21.2	35.4%	22.5%
0.72		6	56.3	48	64.7	44	67	3.24	7.94	14.1%	27.0%
1.41		6	44.2	34.6	53.7	30	58	3.71	9.09	20.6%	42.8%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.00572	0.00398	0.00746	0.00437	0.00897	0.000677	0.00166	29.0%	0.0%
0.00138		6	0.0052	0.00399	0.00641	0.00401	0.00652	0.00047	0.00115	22.1%	9.08%
0.0027		6	0.00568	0.00458	0.00679	0.0043	0.007	0.00043	0.00105	18.5%	0.68%
0.0055		6	0.00607	0.00383	0.00832	0.00362	0.00957	0.000874	0.00214	35.2%	-6.2%
0.011		6	0.00548	0.00473	0.00624	0.00428	0.0064	0.000292	0.000716	13.0%	4.12%
0.0221		6	0.00527	0.00392	0.00662	0.00336	0.00678	0.000526	0.00129	24.4%	7.92%
0.044		6	0.00584	0.00502	0.00665	0.00454	0.00653	0.000317	0.000776	13.3%	-2.07%
0.088		6	0.00592	0.00453	0.0073	0.00448	0.008	0.000538	0.00132	22.3%	-3.4%
0.176		6	0.00614	0.00402	0.00827	0.0042	0.00885	0.000826	0.00202	32.9%	-7.42%
0.36		6	0.00471	0.00285	0.00656	0.00222	0.00708	0.00072	0.00176	37.5%	17.7%
0.72		5	0.00449	0.00194	0.00704	0.0021	0.00757	0.000919	0.00206	45.8%	21.5%
1.41		6	0.00306	0.00229	0.00382	0.00198	0.00385	0.000296	0.000726	23.8%	46.6%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.857	0.762	0.952	0.714	1	0.0369	0.0904	10.5%	0.0%
0.00138		6	0.857	0.693	1	0.714	1	0.0639	0.156	18.3%	0.0%
0.0027		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	0.0%
0.0055		6	0.762	0.58	0.943	0.571	1	0.0706	0.173	22.7%	11.1%
0.011		6	0.762	0.639	0.884	0.571	0.857	0.0476	0.117	15.3%	11.1%
0.0221		6	0.857	0.668	1	0.571	1	0.0738	0.181	21.1%	0.0%
0.044		6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	0.0%
0.088		6	0.833	0.72	0.946	0.714	1	0.0439	0.108	12.9%	2.78%
0.176		6	0.857	0.668	1	0.571	1	0.0738	0.181	21.1%	0.0%
0.36		6	0.81	0.655	0.964	0.571	1	0.0602	0.148	18.2%	5.56%
0.72		6	0.69	0.543	0.838	0.571	0.857	0.0573	0.14	20.3%	19.4%
1.41		6	0.667	0.404	0.929	0.286	1	0.102	0.25	37.5%	22.2%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.857	0.762	0.952	0.714	1	0.0369	0.0904	10.5%	0.0%
0.00138		6	0.857	0.693	1	0.714	1	0.0639	0.156	18.3%	0.0%
0.0027		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	0.0%
0.0055		6	0.762	0.58	0.943	0.571	1	0.0706	0.173	22.7%	11.1%
0.011		6	0.714	0.525	0.904	0.429	0.857	0.0738	0.181	25.3%	16.7%
0.0221		6	0.833	0.634	1	0.571	1	0.0775	0.19	22.8%	2.78%
0.044		6	0.833	0.613	1	0.429	1	0.0858	0.21	25.2%	2.78%
0.088		6	0.762	0.684	0.839	0.714	0.857	0.0301	0.0738	9.68%	11.1%
0.176		6	0.833	0.613	1	0.571	1	0.0858	0.21	25.2%	2.78%
0.36		6	0.738	0.563	0.913	0.571	1	0.0682	0.167	22.6%	13.9%
0.72		6	0.69	0.543	0.838	0.571	0.857	0.0573	0.14	20.3%	19.4%
1.41		6	0.524	0.369	0.679	0.286	0.714	0.0602	0.148	28.2%	38.9%

CETIS Summary Report

Report Date:

02 Jun-16 17:58 (p 3 of 4)

Test Code:

49903201 onion | 11-6506-7627

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	74	81	79	71	98	60
0.00138		94	63	66	64	71	76
0.0027		77	75	89	78	68	61
0.0055		98	81	66	77	75	79
0.011		78	81	60	78	82	74
0.0221		77	70	68	79	63	64
0.044		91	83	79	71	74	69
0.088		87	83	80	64	65	66
0.176		105	86	68	73	67	70
0.36		23	82	61	77	51	65
0.72		44	67	61	55	59	52
1.41		58	42	48	43	44	30

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.00485	0.00507	0.00527	0.0058	0.00897	0.00437
0.00138		0.00652	0.00403	0.0045	0.00401	0.00584	0.0063
0.0027		0.00563	0.00573	0.007	0.00668	0.0043	0.00474
0.0055		0.00957	0.00603	0.00362	0.00737	0.00447	0.0054
0.011		0.00518	0.0055	0.00428	0.0064	0.00577	0.00578
0.0221		0.00553	0.00584	0.00678	0.00601	0.00336	0.00409
0.044		0.00643	0.00653	0.0061	0.00527	0.00616	0.00454
0.088		0.00682	0.00604	0.008	0.00497	0.00518	0.00448
0.176		0.00885	0.00852	0.0042	0.00563	0.00501	0.00466
0.36		0.00222	0.00708	0.0035	0.00621	0.00455	0.00468
0.72		0.00334	0.00435	0.0051	0.0021		0.00757
1.41		0.00385	0.00254	0.00367	0.00345	0.00285	0.00198

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.857	1	0.857	0.714	0.857	0.857
0.00138		0.714	1	0.714	1	1	0.714
0.0027		1	0.857	0.714	0.857	0.714	1
0.0055		0.857	0.571	0.714	0.857	1	0.571
0.011		0.857	0.714	0.571	0.714	0.857	0.857
0.0221		0.571	0.714	0.857	1	1	1
0.044		0.857	0.857	0.857	0.571	1	1
0.088		0.857	0.714	0.857	1	0.857	0.714
0.176		0.571	0.857	0.714	1	1	1
0.36		0.857	0.714	0.857	1	0.857	0.571
0.72		0.714	0.571	0.857	0.571	0.571	0.857
1.41		0.286	0.857	0.714	1	0.571	0.571

CETIS Summary Report**Report Date:**

02 Jun-16 17:58 (p 4 of 4)

Test Code:

49903201 onion | 11-6506-7627

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.857	1	0.857	0.714	0.857	0.857
0.00138		0.714	1	0.714	1	1	0.714
0.0027		1	0.857	0.714	0.857	0.714	1
0.0055		0.857	0.571	0.714	0.857	1	0.571
0.011		0.857	0.714	0.571	0.429	0.857	0.857
0.0221		0.571	0.714	0.714	1	1	1
0.044		0.857	0.857	0.857	0.429	1	1
0.088		0.714	0.714	0.714	0.857	0.857	0.714
0.176		0.571	0.857	0.571	1	1	1
0.36		0.714	0.714	0.857	1	0.571	0.571
0.72		0.714	0.571	0.857	0.571	0.571	0.857
1.41		0.286	0.714	0.429	0.571	0.571	0.571

CETIS Summary Report

Report Date:

02 Jun-16 05:19 (p 1 of 4)

Test Code:

49903201 radish | 00-2793-9149

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID:	01-7026-1273	Test Type:	Seedling Emergence Tier II	Analyst:	
Start Date:	19 Feb-16	Protocol:	OCSPP 850.4100 Plant Seedling Emergen	Diluent:	
Ending Date:	02 Jun-16 03:08	Species:	Raphanus sativus	Brine:	
Duration:	104d 3h	Source:	Sustainable Seed Co., CA	Age:	
Sample ID:	16-0565-3452	Code:	49903201 radish	Client:	CDM Smith - T. Nelis
Sample Date:	19 Feb-16	Material:	2,4-D choline salt	Project:	
Receive Date:	02 Jun-16 03:08	Source:	Dow AgroSciences		
Sample Age:	NA	Station:			

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-2784-2006	Mean Height	0.72	1.41	1.008	20.7%		Dunnett Multiple Comparison Test
06-9089-8801	Mean Weight	0.044	0.088	0.06223	NA		Jonckheere-Terpstra Step-Down Test
21-4217-8731	Mean Weight	0.36	0.72	0.5091	24.8%		Mann-Whitney U Two-Sample Test
15-5525-2334	Percent Emerged	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
17-7481-0334	Percent Emerged	0.176	0.36	0.2517	10.6%		Mann-Whitney U Two-Sample Test
07-7782-3668	Percent Survived	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
13-1197-8836	Percent Survived	0.176	0.36	0.2517	10.5%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
01-8523-3382	Mean Height	IC5	0.306	N/A	0.546		Nonlinear Regression
		IC10	0.487	0.193	0.77		
		IC25	1.06	0.789	1.38		
		IC50	2.53	1.34	4.79		
05-3028-4055	Mean Weight	IC5	0.231	N/A	0.412		Nonlinear Regression
		IC10	0.327	N/A	0.547		
		IC25	0.585	0.349	0.849		
		IC50	1.12	0.855	1.46		
10-0664-4804	Percent Emerged	EC5	0.0274	0.00639	0.0605		Linear Regression (MLE)
		EC10	0.0836	0.0325	0.163		
		EC25	0.54	0.273	1.54		
		EC50	4.28	1.51	35.8		
13-7437-1844	Percent Survived	EC5	0.0276	0.00636	0.061		Linear Regression (MLE)
		EC10	0.082	0.0315	0.16		
		EC25	0.508	0.259	1.4		
		EC50	3.85	1.4	30.3		
01-9145-0742	Percent Survived	EC50	1.39	0.922	2.09		Trimmed Spearman-Kärber

CETIS Summary Report
Report Date:

02 Jun-16 05:19 (p 2 of 4)

Test Code:

49903201 radish | 00-2793-9149

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	70.7	65.7	75.7	62	75	1.94	4.76	6.74%	0.0%
0.00138		6	74.2	66.5	81.9	65	87	2.99	7.33	9.89%	-4.95%
0.0027		6	83.8	78	89.7	78	93	2.27	5.56	6.64%	-18.6%
0.0055		6	66.7	56.3	77	54	79	4.03	9.87	14.8%	5.66%
0.011		6	76.7	65.4	87.9	66	96	4.38	10.7	14.0%	-8.49%
0.0221		6	77.3	65.8	88.8	66	97	4.48	11	14.2%	-9.43%
0.044		6	75.8	63	88.7	58	93	5.01	12.3	16.2%	-7.31%
0.088		6	77	67.9	86.1	69	92	3.54	8.67	11.3%	-8.96%
0.176		6	74.2	63.6	84.8	60	85	4.13	10.1	13.6%	-4.95%
0.36		6	71.3	60.9	81.8	61	85	4.07	9.97	14.0%	-0.94%
0.72		6	61.7	51.1	72.3	50	76	4.12	10.1	16.4%	12.7%
1.41		6	51.3	35.4	67.3	40	81	6.2	15.2	29.6%	27.4%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.0606	0.0532	0.0681	0.0528	0.0706	0.00291	0.00712	11.7%	0.0%
0.00138		6	0.0582	0.0469	0.0695	0.0487	0.0782	0.00438	0.0107	18.4%	4.0%
0.0027		6	0.0759	0.0577	0.0941	0.0552	0.0938	0.00706	0.0173	22.8%	-25.2%
0.0055		6	0.0508	0.0382	0.0633	0.04	0.0679	0.00489	0.012	23.6%	16.3%
0.011		6	0.0635	0.0383	0.0887	0.0457	0.111	0.00982	0.024	37.9%	-4.73%
0.0221		6	0.0596	0.0433	0.0759	0.0456	0.0837	0.00635	0.0156	26.1%	1.69%
0.044		6	0.0558	0.0429	0.0687	0.0427	0.0748	0.00501	0.0123	22.0%	7.97%
0.088		6	0.0521	0.0387	0.0654	0.0405	0.0758	0.00519	0.0127	24.4%	14.1%
0.176		6	0.0529	0.0418	0.064	0.0395	0.067	0.00433	0.0106	20.0%	12.8%
0.36		6	0.0564	0.0367	0.0761	0.0351	0.0788	0.00765	0.0187	33.2%	6.99%
0.72		6	0.0392	0.0265	0.0519	0.0218	0.0531	0.00494	0.0121	30.9%	35.4%
1.41		6	0.024	0.0119	0.0361	0.012	0.045	0.0047	0.0115	47.9%	60.4%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.905	0.827	0.982	0.857	1	0.0301	0.0738	8.15%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0055		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0221		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	0.0%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.088		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.176		6	1	1	1	1	1	0	0	0.0%	-10.5%
0.36		6	0.762	0.639	0.884	0.571	0.857	0.0476	0.117	15.3%	15.8%
0.72		6	0.714	0.502	0.926	0.429	1	0.0825	0.202	28.3%	21.1%
1.41		6	0.5	0.418	0.582	0.429	0.571	0.0319	0.0782	15.6%	44.7%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.905	0.827	0.982	0.857	1	0.0301	0.0738	8.15%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0027		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0055		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.0221		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	0.0%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.088		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-7.89%
0.176		6	1	1	1	1	1	0	0	0.0%	-10.5%
0.36		6	0.762	0.639	0.884	0.571	0.857	0.0476	0.117	15.3%	15.8%
0.72		6	0.714	0.502	0.926	0.429	1	0.0825	0.202	28.3%	21.1%
1.41		6	0.476	0.399	0.554	0.429	0.571	0.0301	0.0738	15.5%	47.4%

CETIS Summary Report

Report Date:

02 Jun-16 05:19 (p 3 of 4)

Test Code:

49903201 radish | 00-2793-9149

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	75	62	69	73	71	74
0.00138		75	65	75	73	87	70
0.0027		93	78	82	84	79	87
0.0055		79	60	62	77	54	68
0.011		77	96	71	66	80	70
0.0221		66	69	79	74	79	97
0.044		73	85	77	69	93	58
0.088		92	76	72	71	69	82
0.176		60	64	83	85	77	76
0.36		85	70	61	63	82	67
0.72		76	60	68	51	50	65
1.41		53	44	43	81	47	40

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.0706	0.0532	0.0626	0.066	0.0587	0.0528
0.00138		0.0617	0.0487	0.0552	0.0539	0.0782	0.0516
0.0027		0.0938	0.0607	0.0656	0.0919	0.0552	0.0883
0.0055		0.0632	0.0426	0.0417	0.0679	0.04	0.049
0.011		0.0635	0.111	0.0526	0.0457	0.0528	0.0552
0.0221		0.0466	0.0537	0.0738	0.0456	0.0542	0.0837
0.044		0.0608	0.0748	0.0484	0.0459	0.0622	0.0427
0.088		0.0758	0.0535	0.0489	0.0516	0.0422	0.0405
0.176		0.0426	0.0395	0.067	0.0556	0.0611	0.0514
0.36		0.0788	0.0437	0.0409	0.0351	0.0737	0.0663
0.72		0.0516	0.0355	0.0416	0.0315	0.0218	0.0531
1.41		0.0253	0.0231	0.0156	0.045	0.0229	0.012

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.857	0.857	1	0.857
0.00138		1	1	0.857	1	1	1
0.0027		1	1	1	1	1	0.857
0.0055		1	1	1	1	1	0.857
0.011		1	1	1	1	1	0.857
0.0221		1	0.857	1	0.857	0.714	1
0.044		0.857	1	1	1	1	1
0.088		1	1	1	1	1	0.857
0.176		1	1	1	1	1	1
0.36		0.857	0.714	0.857	0.714	0.571	0.857
0.72		0.571	0.714	0.857	1	0.429	0.714
1.41		0.571	0.429	0.571	0.429	0.571	0.429

CETIS Summary Report**Report Date:**

02 Jun-16 05:19 (p 4 of 4)

Test Code:

49903201 radish | 00-2793-9149

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.857	0.857	1	0.857
0.00138		1	1	0.857	1	1	1
0.0027		1	1	1	1	1	0.857
0.0055		1	1	1	1	1	0.857
0.011		1	1	1	1	1	0.857
0.0221		1	0.857	1	0.857	0.714	1
0.044		0.857	1	1	1	1	1
0.088		1	1	1	1	1	0.857
0.176		1	1	1	1	1	1
0.36		0.857	0.714	0.857	0.714	0.571	0.857
0.72		0.571	0.714	0.857	1	0.429	0.714
1.41		0.571	0.429	0.571	0.429	0.429	0.429

CETIS Summary Report**Report Date:**

02 Jun-16 05:59 (p 1 of 4)

Test Code:

49903201 sorghu | 14-7234-8750

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 05-0086-5641	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 02 Jun-16 05:50	Species: Sorghum bicolor	Brine:
Duration: 104d 6h	Source: Syngenta Seed Care	Age:
Sample ID: 00-7591-9282	Code: 49903201 sorghu	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 02 Jun-16 05:50	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-9454-3522	Mean Height	1.41	>1.41	NA	10.9%		Dunnett Multiple Comparison Test
04-8520-1230	Mean Weight	1.41	>1.41	NA	22.5%		Mann-Whitney U Two-Sample Test
18-8491-7940	Percent Emerged	1.41	>1.41	NA	12.6%		Mann-Whitney U Two-Sample Test
02-9372-2961	Percent Survived	1.41	>1.41	NA	12.6%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
04-9512-4256	Mean Weight	IC5	0.088	N/A	1.13		Nonlinear Regression
		IC10	0.695	0.0096	5.46		
		IC25	22	N/A	42200		
		IC50	1020	N/A	N/A		
09-8500-3589	Percent Emerged	EC5	0.00189	N/A	N/A		Linear Regression (MLE)
		EC10	6.56	N/A	N/A		
		EC25	5390000	N/A	N/A		
		EC50	20100000	N/A	N/A		
15-3124-8117	Percent Survived	EC5	0.00189	N/A	N/A		Linear Regression (MLE)
		EC10	6.56	N/A	N/A		
		EC25	5390000	N/A	N/A		
		EC50	20100000	N/A	N/A		

CETIS Summary Report
Report Date:

02 Jun-16 05:59 (p 2 of 4)

Test Code:

49903201 sorghu | 14-7234-8750

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	333	313	353	300	355	7.82	19.2	5.75%	0.0%
0.00138		6	344	326	361	325	365	6.65	16.3	4.74%	-3.15%
0.0027		6	336	304	368	298	367	12.5	30.7	9.13%	-0.9%
0.0055		6	343	323	363	325	366	7.62	18.7	5.44%	-3.0%
0.011		6	316	283	349	267	355	12.9	31.7	10.0%	5.06%
0.0221		6	334	302	365	301	385	12.2	29.9	8.96%	-0.25%
0.044		6	328	298	358	275	351	11.6	28.5	8.67%	1.4%
0.083		6	342	310	374	301	379	12.4	30.4	8.87%	-2.8%
0.179		6	329	315	343	313	349	5.42	13.3	4.03%	1.1%
0.35		6	334	323	345	317	346	4.25	10.4	3.11%	-0.4%
0.7		6	316	291	341	293	360	9.72	23.8	7.53%	5.01%
1.41		6	316	283	349	267	351	12.9	31.5	9.97%	5.01%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.17	0.131	0.208	0.127	0.222	0.0149	0.0366	21.6%	0.0%
0.00138		6	0.188	0.16	0.216	0.155	0.228	0.0109	0.0267	14.2%	-10.7%
0.0027		6	0.188	0.125	0.251	0.119	0.25	0.0244	0.0597	31.7%	-10.8%
0.0055		6	0.18	0.174	0.186	0.173	0.188	0.00245	0.00601	3.34%	-6.04%
0.011		6	0.164	0.123	0.206	0.11	0.211	0.016	0.0391	23.8%	3.08%
0.0221		6	0.187	0.127	0.247	0.151	0.302	0.0233	0.0571	30.5%	-10.4%
0.044		6	0.168	0.139	0.197	0.121	0.203	0.0112	0.0275	16.4%	1.02%
0.083		6	0.183	0.167	0.199	0.162	0.199	0.00614	0.015	8.22%	-7.81%
0.179		6	0.147	0.122	0.173	0.124	0.192	0.0101	0.0247	16.8%	13.1%
0.35		6	0.168	0.14	0.196	0.129	0.205	0.0109	0.0268	15.9%	1.04%
0.7		6	0.16	0.122	0.198	0.117	0.209	0.0147	0.0361	22.5%	5.61%
1.41		6	0.165	0.119	0.21	0.0973	0.223	0.0177	0.0434	26.3%	2.81%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.0027		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	0.0%
0.0055		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.011		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	-8.33%
0.0221		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.044		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	-8.33%
0.083		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.179		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-11.1%
0.35		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	-5.56%
0.7		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	-5.56%
1.41		6	0.881	0.734	1	0.714	1	0.0573	0.14	15.9%	-2.78%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	0.0%
0.00138		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.0027		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	0.0%
0.0055		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.011		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	-8.33%
0.0221		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.044		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	-8.33%
0.083		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-13.9%
0.179		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	-11.1%
0.35		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	-5.56%
0.7		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	-5.56%
1.41		6	0.881	0.734	1	0.714	1	0.0573	0.14	15.9%	-2.78%

CETIS Summary Report

Report Date:

02 Jun-16 05:59 (p 3 of 4)

Test Code:

49903201 sorghu | 14-7234-8750

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	346	327	340	300	355	330
0.00138		355	334	329	353	365	325
0.0027		367	358	361	330	302	298
0.0055		335	340	326	366	325	366
0.011		293	338	323	321	355	267
0.0221		385	301	316	320	331	350
0.044		335	320	339	351	275	350
0.083		339	301	314	354	367	379
0.179		339	313	349	332	320	323
0.35		317	335	344	332	346	332
0.7		304	325	305	360	293	311
1.41		308	310	311	351	267	351

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.222	0.175	0.198	0.127	0.161	0.135
0.00138		0.228	0.198	0.194	0.192	0.16	0.155
0.0027		0.226	0.247	0.25	0.157	0.119	0.13
0.0055		0.177	0.186	0.173	0.177	0.178	0.188
0.011		0.138	0.211	0.199	0.146	0.183	0.11
0.0221		0.302	0.158	0.18	0.151	0.163	0.169
0.044		0.203	0.164	0.18	0.178	0.121	0.163
0.083		0.192	0.172	0.162	0.177	0.199	0.196
0.179		0.156	0.192	0.14	0.126	0.146	0.124
0.35		0.186	0.205	0.178	0.129	0.153	0.157
0.7		0.178	0.183	0.151	0.209	0.117	0.123
1.41		0.164	0.172	0.14	0.223	0.0973	0.194

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.571	1	0.857	0.857
0.00138		1	1	0.857	1	1	1
0.0027		0.857	1	0.714	1	0.857	0.714
0.0055		1	1	1	1	1	0.857
0.011		1	1	1	0.857	1	0.714
0.0221		1	1	1	1	1	0.857
0.044		1	0.857	1	0.857	1	0.857
0.083		1	0.857	1	1	1	1
0.179		1	1	1	0.857	0.857	1
0.35		0.857	0.857	1	1	1	0.714
0.7		0.857	1	0.857	0.714	1	1
1.41		0.857	0.714	1	1	1	0.714

CETIS Summary Report**Report Date:**

02 Jun-16 05:59 (p 4 of 4)

Test Code:

49903201 sorghu | 14-7234-8750

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	0.571	1	0.857	0.857
0.00138		1	1	0.857	1	1	1
0.0027		0.857	1	0.714	1	0.857	0.714
0.0055		1	1	1	1	1	0.857
0.011		1	1	1	0.857	1	0.714
0.0221		1	1	1	1	1	0.857
0.044		1	0.857	1	0.857	1	0.857
0.083		1	0.857	1	1	1	1
0.179		1	1	1	0.857	0.857	1
0.35		0.857	0.857	1	1	1	0.714
0.7		0.857	1	0.857	0.714	1	1
1.41		0.857	0.714	1	1	1	0.714

CETIS Summary Report

Report Date:

03 Jun-16 08:31 (p 1 of 4)

Test Code:

49903201 soybea | 07-4428-5127

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID:	19-3327-1639	Test Type:	Seedling Emergence Tier II	Analyst:	
Start Date:	19 Feb-16	Protocol:	OCSPP 850.4100 Plant Seedling Emergen	Diluent:	
Ending Date:	02 Jun-16 05:22	Species:	Glycine max	Brine:	
Duration:	104d 5h	Source:	Missouri Foundation Seeds, MO	Age:	
Sample ID:	03-2541-1292	Code:	49903201 soybea	Client:	CDM Smith - T. Nelis
Sample Date:	19 Feb-16	Material:	2,4-D choline salt	Project:	
Receive Date:	02 Jun-16 05:22	Source:	Dow AgroSciences		
Sample Age:	NA	Station:			

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-7965-5413	Mean Height	1.41	>1.41	NA	NA		Jonckheere-Terpstra Step-Down Test
09-6025-2249	Mean Height	0.35	0.7	0.495	12.1%		Mann-Whitney U Two-Sample Test
17-7808-8460	Mean Weight	1.41	>1.41	NA	20.4%		Dunnett Multiple Comparison Test
20-9470-2693	Percent Emerged	1.41	>1.41	NA	12.7%		Mann-Whitney U Two-Sample Test
20-6430-4300	Percent Survived	1.41	>1.41	NA	12.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ai/A	95% LCL	95% UCL	TU	Method
18-9905-8811	Mean Height	IC5	0.0024	N/A	0.656		Nonlinear Regression
		IC10	1.41	0.000634	179		
		IC25	59500	N/A	3.37E+13		
		IC50	82200000	N/A	N/A		
05-3662-8203	Percent Emerged	EC5	12.5	N/A	N/A		Linear Regression (MLE)
		EC10	0.00713	N/A	N/A		
		EC25	0.0000000	N/A	N/A		
		EC50	0.0000000	N/A	N/A		
04-7159-5296	Percent Survived	EC5	109	N/A	N/A		Linear Regression (MLE)
		EC10	0.00644	N/A	N/A		
		EC25	0.0000000	N/A	N/A		
		EC50	7.87E-18	N/A	N/A		

CETIS Summary Report
Report Date:

03 Jun-16 08:31 (p 2 of 4)

Test Code:

49903201 soybea | 07-4428-5127

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	228	204	253	200	261	9.59	23.5	10.3%	0.0%
0.00138		6	205	164	245	142	249	15.7	38.5	18.8%	10.3%
0.0027		6	201	148	253	104	241	20.5	50.2	25.0%	12.0%
0.0055		6	209	191	227	192	234	6.92	16.9	8.11%	8.47%
0.011		6	217	195	239	189	245	8.39	20.6	9.48%	4.96%
0.0221		6	209	187	230	185	236	8.38	20.5	9.84%	8.61%
0.044		6	229	210	247	206	258	7.12	17.4	7.63%	-0.07%
0.083		6	214	194	234	192	240	7.94	19.4	9.09%	6.28%
0.179		6	211	201	220	195	217	3.51	8.6	4.08%	7.81%
0.35		6	212	188	236	178	239	9.42	23.1	10.9%	7.15%
0.7		6	205	187	224	178	221	7.15	17.5	8.53%	10.1%
1.41		6	195	162	229	141	234	13.1	32.1	16.5%	14.5%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.551	0.484	0.617	0.43	0.618	0.0257	0.063	11.5%	0.0%
0.00138		6	0.625	0.549	0.702	0.536	0.747	0.0298	0.0729	11.7%	-13.6%
0.0027		6	0.608	0.505	0.712	0.433	0.724	0.0403	0.0988	16.2%	-10.5%
0.0055		6	0.582	0.519	0.645	0.517	0.664	0.0245	0.06	10.3%	-5.74%
0.011		6	0.601	0.536	0.666	0.507	0.677	0.0253	0.0619	10.3%	-9.17%
0.0221		6	0.563	0.493	0.632	0.493	0.663	0.027	0.0661	11.8%	-2.23%
0.044		6	0.67	0.579	0.762	0.517	0.74	0.0355	0.0871	13.0%	-21.8%
0.083		6	0.612	0.51	0.715	0.46	0.753	0.0399	0.0978	16.0%	-11.2%
0.179		6	0.658	0.579	0.736	0.566	0.769	0.0305	0.0746	11.3%	-19.4%
0.35		6	0.604	0.524	0.683	0.519	0.731	0.0309	0.0758	12.6%	-9.65%
0.7		6	0.612	0.529	0.695	0.508	0.743	0.0323	0.0792	12.9%	-11.1%
1.41		6	0.511	0.436	0.586	0.421	0.601	0.0291	0.0712	13.9%	7.15%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.00138		6	0.881	0.682	1	0.571	1	0.0775	0.19	21.6%	7.5%
0.0027		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.0055		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
0.011		6	0.881	0.734	1	0.714	1	0.0573	0.14	15.9%	7.5%
0.0221		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.044		6	0.857	0.693	1	0.714	1	0.0639	0.156	18.3%	10.0%
0.083		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	0.0%
0.179		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	10.0%
0.35		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.7		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
1.41		6	1	1	1	1	1	0	0	0.0%	-5.0%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.00138		6	0.881	0.682	1	0.571	1	0.0775	0.19	21.6%	7.5%
0.0027		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.0055		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
0.011		6	0.881	0.734	1	0.714	1	0.0573	0.14	15.9%	7.5%
0.0221		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.044		6	0.857	0.693	1	0.714	1	0.0639	0.156	18.3%	10.0%
0.083		6	0.952	0.83	1	0.714	1	0.0476	0.117	12.2%	0.0%
0.179		6	0.857	0.723	0.991	0.714	1	0.0522	0.128	14.9%	10.0%
0.35		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.7		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
1.41		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%

CETIS Summary Report

Report Date:

03 Jun-16 08:31 (p 3 of 4)

Test Code:

49903201 soybea | 07-4428-5127

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	200	206	228	248	227	261
0.00138		215	178	217	142	228	249
0.0027		104	234	203	200	223	241
0.0055		200	213	193	234	222	192
0.011		217	189	209	245	236	206
0.0221		200	185	202	197	236	232
0.044		220	206	235	223	258	229
0.083		195	206	230	240	192	221
0.179		214	217	217	214	206	195
0.35		198	203	222	239	178	232
0.7		221	198	178	220	219	196
1.41		212	205	178	141	234	202

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.555	0.43	0.567	0.566	0.567	0.618
0.00138		0.647	0.577	0.644	0.536	0.601	0.747
0.0027		0.433	0.614	0.576	0.66	0.724	0.641
0.0055		0.664	0.517	0.565	0.597	0.632	0.518
0.011		0.593	0.558	0.629	0.643	0.677	0.507
0.0221		0.624	0.493	0.533	0.518	0.663	0.547
0.044		0.617	0.72	0.698	0.517	0.731	0.74
0.083		0.753	0.651	0.566	0.643	0.46	0.6
0.179		0.769	0.718	0.566	0.606	0.634	0.652
0.35		0.577	0.555	0.519	0.651	0.59	0.731
0.7		0.613	0.615	0.558	0.635	0.508	0.743
1.41		0.556	0.421	0.475	0.452	0.561	0.601

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	0.857	1	0.857	1
0.00138		1	0.714	1	0.571	1	1
0.0027		0.857	1	0.857	1	1	0.714
0.0055		1	1	0.857	0.857	1	0.857
0.011		0.857	1	0.714	1	0.714	1
0.0221		1	1	1	0.857	0.857	1
0.044		1	0.714	1	1	0.714	0.714
0.083		0.714	1	1	1	1	1
0.179		1	1	0.714	0.857	0.714	0.857
0.35		1	1	0.857	0.714	0.857	1
0.7		1	0.857	0.857	1	1	0.857
1.41		1	1	1	1	1	1

CETIS Summary Report**Report Date:**

03 Jun-16 08:31 (p 4 of 4)

Test Code:

49903201 soybea | 07-4428-5127

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	0.857	1	0.857	1
0.00138		1	0.714	1	0.571	1	1
0.0027		0.857	1	0.857	1	1	0.714
0.0055		1	1	0.857	0.857	1	0.857
0.011		0.857	1	0.714	1	0.714	1
0.0221		1	1	1	0.857	0.857	1
0.044		1	0.714	1	1	0.714	0.714
0.083		0.714	1	1	1	1	1
0.179		1	1	0.714	0.857	0.714	0.857
0.35		1	1	0.857	0.714	0.857	1
0.7		1	0.857	0.857	1	1	0.857
1.41		1	1	1	0.857	1	1

CETIS Summary Report**Report Date:**

02 Jun-16 06:17 (p 1 of 4)

Test Code:

49903201 sunflo | 15-2515-4311

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 07-3975-5606	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 02 Jun-16 06:05	Species: Helianthus annuua	Brine:
Duration: 104d 6h	Source: Johnny's Selected Seeds, ME	Age:
Sample ID: 12-0179-1607	Code: 49903201 sunflo	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 02 Jun-16 06:05	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
01-6487-0613	Mean Height	1.41	>1.41	NA	NA		Jonckheere-Terpstra Step-Down Test
06-3911-3686	Mean Height	<0.00138	0.00138	NA	12.3%		Dunnett Multiple Comparison Test
21-3905-3590	Mean Weight	1.41	>1.41	NA	19.9%		Dunnett Multiple Comparison Test
02-6955-7768	Percent Emerged	1.41	>1.41	NA	5.63%		Mann-Whitney U Two-Sample Test
16-3998-3348	Percent Survived	1.41	>1.41	NA	5.63%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
10-0318-4111	Mean Height	IC5	10.1	N/A	39000		Nonlinear Regression
		IC10	971	N/A	1.38E+10		
		IC25	1990000	N/A	N/A		
		IC50	94900000	N/A	N/A		
15-2125-0462	Mean Weight	IC5	0.478	0.000705	5.49		Nonlinear Regression
		IC10	7.05	N/A	1350		
		IC25	634	N/A	N/A		
		IC50	94000	N/A	N/A		
20-4952-6396	Percent Emerged	EC5	0.0000000	N/A	N/A		Linear Regression (MLE)
		EC10	1.71E-21	N/A	N/A		
		EC25	3.02E-40	N/A	N/A		
		EC50	0	N/A	N/A		
17-9243-8071	Percent Survived	EC5	0.0000000	N/A	N/A		Linear Regression (MLE)
		EC10	1.71E-21	N/A	N/A		
		EC25	3.02E-40	N/A	N/A		
		EC50	0	N/A	N/A		

CETIS Summary Report
Report Date:

02 Jun-16 06:17 (p 2 of 4)

Test Code:

49903201 sunflo | 15-2515-4311

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	314	293	335	291	346	8.26	20.2	6.45%	0.0%
0.00138		6	275	254	296	243	292	8.25	20.2	7.35%	12.5%
0.0027		6	294	258	330	249	347	14	34.3	11.7%	6.48%
0.0055		6	283	237	329	229	337	17.9	43.7	15.4%	9.77%
0.011		6	313	284	341	278	358	11.1	27.3	8.72%	0.37%
0.0221		6	297	261	333	229	323	14.1	34.4	11.6%	5.36%
0.044		6	314	301	326	296	325	4.77	11.7	3.72%	0.16%
0.083		6	293	264	322	256	329	11.3	27.6	9.43%	6.69%
0.179		6	313	287	339	298	363	10.1	24.7	7.88%	0.21%
0.35		6	301	274	327	260	337	10.2	25	8.34%	4.3%
0.7		6	295	275	315	278	329	7.7	18.9	6.39%	6.05%
1.41		6	280	272	288	273	292	3.3	8.07	2.88%	10.8%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.687	0.617	0.756	0.631	0.808	0.027	0.0662	9.64%	0.0%
0.00138		6	0.725	0.62	0.831	0.532	0.814	0.0411	0.101	13.9%	-5.58%
0.0027		6	0.693	0.593	0.794	0.545	0.804	0.0392	0.0961	13.9%	-0.94%
0.0055		6	0.726	0.658	0.794	0.627	0.784	0.0266	0.0651	8.97%	-5.69%
0.011		6	0.74	0.573	0.906	0.608	0.959	0.0647	0.158	21.4%	-7.69%
0.0221		6	0.7	0.626	0.773	0.582	0.783	0.0286	0.0702	10.0%	-1.87%
0.044		6	0.692	0.613	0.77	0.594	0.756	0.0305	0.0747	10.8%	-0.67%
0.083		6	0.679	0.586	0.771	0.56	0.768	0.036	0.0882	13.0%	1.21%
0.179		6	0.69	0.563	0.818	0.545	0.844	0.0495	0.121	17.6%	-0.5%
0.35		6	0.659	0.581	0.737	0.588	0.803	0.0305	0.0747	11.3%	4.07%
0.7		6	0.696	0.627	0.765	0.639	0.814	0.0268	0.0656	9.42%	-1.33%
1.41		6	0.611	0.513	0.708	0.513	0.734	0.0379	0.0929	15.2%	11.1%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00138		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
0.0027		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0055		6	1	1	1	1	1	0	0	0.0%	0.0%
0.011		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	7.14%
0.0221		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.083		6	1	1	1	1	1	0	0	0.0%	0.0%
0.179		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
0.35		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.7		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
1.41		6	1	1	1	1	1	0	0	0.0%	0.0%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00138		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
0.0027		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0055		6	1	1	1	1	1	0	0	0.0%	0.0%
0.011		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	7.14%
0.0221		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.083		6	1	1	1	1	1	0	0	0.0%	0.0%
0.179		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
0.35		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	2.38%
0.7		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	4.76%
1.41		6	1	1	1	1	1	0	0	0.0%	0.0%

CETIS Summary Report

Report Date:

02 Jun-16 06:17 (p 3 of 4)

Test Code:

49903201 sunflo | 15-2515-4311

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	303	300	291	327	317	346
0.00138		264	243	292	292	267	291
0.0027		282	298	272	249	347	314
0.0055		229	236	280	318	300	337
0.011		322	278	294	309	316	358
0.0221		229	298	306	315	312	323
0.044		296	323	320	325	303	314
0.083		256	329	268	288	312	305
0.179		298	310	363	304	305	300
0.35		260	303	311	337	294	298
0.7		296	285	301	329	281	278
1.41		273	273	276	288	292	278

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.808	0.681	0.631	0.711	0.655	0.636
0.00138		0.814	0.707	0.776	0.768	0.532	0.755
0.0027		0.725	0.755	0.614	0.545	0.804	0.718
0.0055		0.784	0.662	0.759	0.627	0.748	0.776
0.011		0.921	0.693	0.608	0.614	0.644	0.959
0.0221		0.706	0.783	0.757	0.692	0.582	0.678
0.044		0.756	0.731	0.714	0.754	0.594	0.601
0.083		0.713	0.76	0.56	0.584	0.685	0.768
0.179		0.844	0.603	0.829	0.667	0.545	0.654
0.35		0.646	0.66	0.632	0.803	0.624	0.588
0.7		0.655	0.707	0.648	0.814	0.713	0.639
1.41		0.513	0.645	0.545	0.695	0.534	0.734

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00138		0.857	1	0.857	1	1	1
0.0027		1	1	1	1	1	1
0.0055		1	1	1	1	1	1
0.011		0.857	1	0.857	1	1	0.857
0.0221		1	0.857	1	1	1	0.857
0.044		1	1	1	0.857	1	1
0.083		1	1	1	1	1	1
0.179		1	1	1	0.857	0.857	1
0.35		1	1	1	0.857	1	1
0.7		1	0.857	0.857	1	1	1
1.41		1	1	1	1	1	1

CETIS Summary Report**Report Date:**

02 Jun-16 06:17 (p 4 of 4)

Test Code:

49903201 sunflo | 15-2515-4311

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00138		0.857	1	0.857	1	1	1
0.0027		1	1	1	1	1	1
0.0055		1	1	1	1	1	1
0.011		0.857	1	0.857	1	1	0.857
0.0221		1	0.857	1	1	1	0.857
0.044		1	1	1	0.857	1	1
0.083		1	1	1	1	1	1
0.179		1	1	1	0.857	0.857	1
0.35		1	1	1	0.857	1	1
0.7		1	0.857	0.857	1	1	1
1.41		1	1	1	1	1	1

CETIS Summary Report**Report Date:**

02 Jun-16 06:32 (p 1 of 4)

Test Code:

49903201 tomato | 10-4118-3223

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 01-6627-7993	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 02 Jun-16 06:20	Species: Lycopersicon esculentum	Brine:
Duration: 104d 6h	Source: Sustainable Seed Co., CA	Age:
Sample ID: 18-9128-2177	Code: 49903201 tomato	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 02 Jun-16 06:20	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-5642-2162	Mean Height	0.72	1.41	1.008	NA		Jonckheere-Terpstra Step-Down Test
18-5789-5159	Mean Height	0.72	1.41	1.008	16.1%		Dunnett Multiple Comparison Test
07-7293-0143	Mean Weight	1.41	>1.41	NA	NA		Jonckheere-Terpstra Step-Down Test
04-4420-1798	Mean Weight	0.72	1.41	1.008	35.3%		Dunnett Multiple Comparison Test
20-4319-9422	Percent Emerged	0.72	1.41	1.008	NA		Jonckheere-Terpstra Step-Down Test
14-9856-1734	Percent Emerged	0.72	1.41	1.008	15.8%		Mann-Whitney U Two-Sample Test
14-6055-8095	Percent Survived	0.36	0.72	0.5091	NA		Jonckheere-Terpstra Step-Down Test
13-2438-3938	Percent Survived	0.72	1.41	1.008	15.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
20-8515-0387	Mean Height	IC5	0.641	N/A	1.1		Nonlinear Regression
		IC10	0.932	0.435	1.35		
		IC25	1.74	0.935	2.68		
		IC50	3.48	0.485	25		
04-2729-4500	Mean Weight	IC5	0.747	N/A	1.26		Nonlinear Regression
		IC10	0.889	N/A	1.45		
		IC25	1.19	0.63	1.6		
		IC50	1.65	1.05	2.59		
01-2590-6460	Percent Emerged	EC5	0.0015	N/A	0.0121		Linear Regression (MLE)
		EC10	0.0343	0.000901	0.193		
		EC25	6.37	0.665	3000000		
		EC50	2120	23	1E+10		
05-6007-4554	Percent Survived	EC5	0.00163	N/A	0.012		Linear Regression (MLE)
		EC10	0.0324	0.00121	0.159		
		EC25	4.8	0.596	140000		
		EC50	1240	19.1	1E+10		

CETIS Summary Report

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Test Code:

49903201 tomato | 10-4118-3223

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Summary**

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	121	102	140	93	143	7.29	17.8	14.7%	0.0%
0.00138		6	104	86	122	80	133	7.06	17.3	16.6%	14.0%
0.0027		6	105	89.2	121	85	119	6.2	15.2	14.4%	13.2%
0.0055		6	104	92	116	89	124	4.67	11.4	11.0%	14.2%
0.011		6	121	115	127	117	132	2.39	5.85	4.82%	-0.14%
0.0221		6	109	94.5	124	89	128	5.69	13.9	12.8%	9.9%
0.044		6	117	104	129	97	130	4.83	11.8	10.1%	3.58%
0.088		6	110	93.2	126	81	123	6.4	15.7	14.3%	9.49%
0.176		6	111	97.5	125	94	131	5.33	13.1	11.7%	8.25%
0.36		6	108	94.9	121	86	124	5.11	12.5	11.6%	10.9%
0.72		6	105	95.5	115	92	116	3.83	9.37	8.9%	13.1%
1.41		6	90	78.9	101	77	108	4.34	10.6	11.8%	25.7%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.0643	0.043	0.0857	0.0363	0.0907	0.00832	0.0204	31.7%	0.0%
0.00138		6	0.046	0.0291	0.0629	0.0242	0.0721	0.00658	0.0161	35.1%	28.6%
0.0027		6	0.0516	0.0349	0.0682	0.0303	0.0649	0.00649	0.0159	30.8%	19.9%
0.0055		6	0.0458	0.0326	0.059	0.0342	0.0689	0.00515	0.0126	27.5%	28.8%
0.011		6	0.0632	0.0512	0.0753	0.0477	0.0802	0.00469	0.0115	18.2%	1.74%
0.0221		6	0.0543	0.0449	0.0636	0.0447	0.0687	0.00364	0.0089	16.4%	15.7%
0.044		6	0.0579	0.0441	0.0716	0.0405	0.078	0.00535	0.0131	22.7%	10.1%
0.088		6	0.0599	0.0362	0.0836	0.0275	0.0892	0.00921	0.0226	37.7%	6.92%
0.176		6	0.0564	0.0353	0.0775	0.0386	0.0845	0.00822	0.0201	35.7%	12.3%
0.36		6	0.0547	0.0396	0.0699	0.0312	0.0754	0.0059	0.0144	26.4%	15.0%
0.72		6	0.0531	0.0382	0.068	0.0388	0.0795	0.0058	0.0142	26.8%	17.5%
1.41		6	0.0347	0.0254	0.0441	0.0251	0.0483	0.00363	0.0089	25.6%	46.0%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.00138		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	2.5%
0.0027		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.0055		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.011		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	2.5%
0.0221		6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	10.0%
0.044		6	0.857	0.762	0.952	0.714	1	0.0369	0.0904	10.5%	10.0%
0.088		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.176		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	2.5%
0.36		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
0.72		6	0.81	0.53	1	0.286	1	0.109	0.266	32.9%	15.0%
1.41		6	0.714	0.446	0.982	0.286	1	0.104	0.256	35.8%	25.0%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.00138		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	2.5%
0.0027		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.0055		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.011		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	2.5%
0.0221		6	0.857	0.693	1	0.571	1	0.0639	0.156	18.3%	10.0%
0.044		6	0.857	0.762	0.952	0.714	1	0.0369	0.0904	10.5%	10.0%
0.088		6	0.905	0.782	1	0.714	1	0.0476	0.117	12.9%	5.0%
0.176		6	0.929	0.803	1	0.714	1	0.0488	0.12	12.9%	2.5%
0.36		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
0.72		6	0.786	0.505	1	0.286	1	0.109	0.267	34.0%	17.5%
1.41		6	0.714	0.446	0.982	0.286	1	0.104	0.256	35.8%	25.0%

CETIS Summary Report

Report Date:

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Test Code:

49903201 tomato | 10-4118-3223

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	130	115	143	113	93	133
0.00138		108	106	80	97	133	101
0.0027		110	119	85	117	87	113
0.0055		106	100	124	101	104	89
0.011		117	132	124	120	118	117
0.0221		103	102	128	119	89	114
0.044		121	130	109	122	122	97
0.088		123	111	123	115	81	105
0.176		131	111	101	119	111	94
0.36		108	86	124	110	114	106
0.72		111	112	97	104	116	92
1.41		77	108	87	95	89	84

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.0721	0.0582	0.0907	0.0486	0.0363	0.0802
0.00138		0.0538	0.0466	0.0242	0.0392	0.0721	0.0399
0.0027		0.0631	0.0617	0.0303	0.0649	0.0324	0.057
0.0055		0.0472	0.0483	0.0689	0.0375	0.0342	0.0387
0.011		0.0477	0.0802	0.0667	0.0597	0.0553	0.0698
0.0221		0.0484	0.0447	0.0687	0.0587	0.0483	0.0568
0.044		0.0601	0.078	0.0478	0.0563	0.0646	0.0405
0.088		0.0892	0.0493	0.0784	0.0668	0.0275	0.0482
0.176		0.0845	0.0418	0.0445	0.0792	0.0497	0.0386
0.36		0.0515	0.0312	0.0754	0.0585	0.06	0.0517
0.72		0.0574	0.0484	0.0473	0.0472	0.0795	0.0388
1.41		0.0251	0.0483	0.032	0.035	0.0415	0.0266

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	1	1	1	0.857
0.00138		0.714	1	1	1	1	0.857
0.0027		1	1	1	1	0.857	0.857
0.0055		0.857	1	0.857	1	1	1
0.011		1	1	0.714	1	1	0.857
0.0221		0.857	1	0.857	0.857	1	0.571
0.044		0.857	0.857	0.714	0.857	1	0.857
0.088		1	1	0.857	0.714	0.857	1
0.176		0.714	1	1	0.857	1	1
0.36		0.857	0.857	1	0.857	1	1
0.72		1	0.857	0.857	0.857	0.286	1
1.41		0.571	0.857	0.714	0.857	0.286	1

CETIS Summary Report**Report Date:**

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Test Code:

49903201 tomato | 10-4118-3223

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	0.857	1	1	1	0.857
0.00138		0.714	1	1	1	1	0.857
0.0027		1	1	1	1	0.857	0.857
0.0055		0.857	1	0.857	1	1	1
0.011		1	1	0.714	1	1	0.857
0.0221		0.857	1	0.857	0.857	1	0.571
0.044		0.857	0.857	0.714	0.857	1	0.857
0.088		1	1	0.857	0.714	0.857	1
0.176		0.714	1	1	0.857	1	1
0.36		0.857	0.857	1	0.857	1	1
0.72		1	0.857	0.714	0.857	0.286	1
1.41		0.571	0.857	0.714	0.857	0.286	1

CETIS Summary Report**Report Date:**

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Test Code:

49903201 wheat | 03-3163-5845

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs**

Batch ID: 17-0609-9050	Test Type: Seedling Emergence Tier II	Analyst:
Start Date: 19 Feb-16	Protocol: OCSPP 850.4100 Plant Seedling Emergen	Diluent:
Ending Date: 02 Jun-16 06:34	Species: Triticum aestivum	Brine:
Duration: 104d 7h	Source: L.A. Hearne Company	Age:
Sample ID: 05-2676-6489	Code: 49903201 wheat	Client: CDM Smith - T. Nelis
Sample Date: 19 Feb-16	Material: 2,4-D choline salt	Project:
Receive Date: 02 Jun-16 06:34	Source: Dow AgroSciences	
Sample Age: NA	Station:	

Batch Note: 2,4-D choline salt + glyphosate DMA**Sample Note:** 2,4-D choline salt + glyphosate DMA**Comparison Summary**

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-2649-5988	Mean Height	1.41	>1.41	NA	7.11%		Dunnett Multiple Comparison Test
13-8912-4739	Mean Weight	1.41	>1.41	NA	42.0%		Dunnett Multiple Comparison Test
20-1694-6049	Percent Emerged	1.41	>1.41	NA	6.19%		Mann-Whitney U Two-Sample Test
19-9545-3895	Percent Survived	1.41	>1.41	NA	6.41%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	Ibs ai/A	95% LCL	95% UCL	TU	Method
15-9504-2416	Percent Emerged	EC5	0	N/A	N/A		Linear Regression (MLE)
		EC10	0	N/A	N/A		
		EC25	0	N/A	N/A		
		EC50	0	N/A	N/A		

CETIS Summary Report
Report Date:

02 Jun-16 06:41 (p 2 of 4)

Test Code:

49903201 wheat | 03-3163-5845

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)
ABC Labs
Mean Height Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	321	304	338	293	337	6.63	16.2	5.06%	0.0%
0.00138		6	330	308	352	298	354	8.51	20.8	6.32%	-2.75%
0.0027		6	315	294	335	284	336	8.02	19.6	6.25%	1.97%
0.0055		6	324	309	339	301	343	5.89	14.4	4.45%	-0.99%
0.011		6	331	321	341	318	345	3.95	9.67	2.92%	-3.27%
0.0221		6	332	313	351	311	356	7.39	18.1	5.45%	-3.58%
0.044		6	315	295	336	289	332	7.9	19.4	6.14%	1.71%
0.083		6	314	296	331	288	329	6.96	17	5.43%	2.29%
0.179		6	324	313	335	304	334	4.28	10.5	3.24%	-0.94%
0.35		6	322	307	337	309	344	5.74	14	4.37%	-0.31%
0.7		6	338	326	350	326	358	4.67	11.4	3.39%	-5.25%
1.41		6	334	323	344	321	342	3.91	9.57	2.87%	-3.95%

Mean Weight Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.0975	0.0672	0.128	0.0627	0.143	0.0118	0.0289	29.6%	0.0%
0.00138		6	0.1	0.0681	0.132	0.0441	0.133	0.0125	0.0306	30.5%	-2.78%
0.0027		6	0.0692	0.0352	0.103	0.0228	0.103	0.0132	0.0324	46.8%	29.0%
0.0055		6	0.101	0.0898	0.112	0.0871	0.113	0.0044	0.0108	10.7%	-3.65%
0.011		6	0.0886	0.0554	0.122	0.0438	0.118	0.0129	0.0317	35.7%	9.09%
0.0221		6	0.116	0.0854	0.146	0.0689	0.146	0.0118	0.0289	25.0%	-18.8%
0.044		6	0.0698	0.0302	0.109	0.0106	0.107	0.0154	0.0378	54.1%	28.4%
0.083		6	0.106	0.0796	0.132	0.0777	0.141	0.0103	0.0251	23.7%	-8.73%
0.179		6	0.0914	0.0689	0.114	0.0583	0.112	0.00877	0.0215	23.5%	6.25%
0.35		6	0.0946	0.0681	0.121	0.0529	0.129	0.0103	0.0253	26.8%	2.94%
0.7		6	0.0973	0.081	0.114	0.0731	0.117	0.00634	0.0155	16.0%	0.24%
1.41		6	0.094	0.0575	0.131	0.0527	0.145	0.0142	0.0348	37.0%	3.55%

Percent Emerged Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.00138		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.0027		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.0055		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.0221		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.083		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.179		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.35		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.7		6	1	1	1	1	1	0	0	0.0%	-5.0%
1.41		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%

Percent Survived Summary

C-lbs ai/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.00138		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.0027		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.0055		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.011		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.0221		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.044		6	0.976	0.915	1	0.857	1	0.0238	0.0583	5.97%	-2.5%
0.083		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%
0.179		6	1	1	1	1	1	0	0	0.0%	-5.0%
0.35		6	0.952	0.875	1	0.857	1	0.0301	0.0738	7.75%	0.0%
0.7		6	1	1	1	1	1	0	0	0.0%	-5.0%
1.41		6	0.929	0.846	1	0.857	1	0.0319	0.0782	8.43%	2.5%

CETIS Summary Report

Report Date:

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Test Code:

49903201 wheat | 03-3163-5845

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Mean Height Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	335	315	293	318	327	337
0.00138		336	334	312	354	298	344
0.0027		301	333	284	318	336	315
0.0055		326	301	316	333	325	343
0.011		340	328	329	345	318	328
0.0221		341	318	311	321	356	347
0.044		289	293	321	332	325	332
0.083		329	322	322	324	296	288
0.179		329	304	326	322	328	334
0.35		312	313	344	319	309	334
0.7		341	332	339	358	330	326
1.41		342	337	322	321	337	342

Mean Weight Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.114	0.0944	0.0627	0.0725	0.143	0.0985
0.00138		0.1	0.122	0.0996	0.103	0.0441	0.133
0.0027		0.0639	0.095	0.0228	0.0405	0.103	0.0901
0.0055		0.0871	0.112	0.0904	0.113	0.0986	0.106
0.011		0.112	0.118	0.098	0.106	0.0539	0.0438
0.0221		0.146	0.11	0.0689	0.103	0.145	0.121
0.044		0.0718	0.0106	0.0986	0.0922	0.039	0.107
0.083		0.0959	0.113	0.141	0.126	0.0821	0.0777
0.179		0.108	0.0583	0.103	0.0722	0.095	0.112
0.35		0.106	0.101	0.129	0.0833	0.0529	0.0957
0.7		0.106	0.117	0.0917	0.106	0.0731	0.0898
1.41		0.0838	0.106	0.145	0.0618	0.0527	0.115

Percent Emerged Detail

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	0.857	1	0.857	
0.00138		1	1	1	0.857	1	0.857
0.0027		0.857	1	0.857	1	1	1
0.0055		1	1	1	1	1	1
0.011		1	1	1	0.857	1	1
0.0221		1	1	1	1	1	1
0.044		1	1	1	1	0.857	1
0.083		1	1	0.857	0.857	1	1
0.179		1	1	1	1	1	1
0.35		0.857	1	1	1	1	1
0.7		1	1	1	1	1	1
1.41		1	1	1	0.857	0.857	0.857

CETIS Summary Report**Report Date:**

02 Jun-16 06:41 (p 4 of 4)

Test Code:

49903201 wheat | 03-3163-5845

OCSPP 850.4100 Terrestrial Plant Tier II (Seedling Emergence)**ABC Labs****Percent Survived Detail**

C-lbs ai/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	0.857	1	0.857
0.00138		1	1	1	0.857	1	0.857
0.0027		0.857	1	0.857	1	1	1
0.0055		1	1	1	1	1	1
0.011		1	1	1	0.857	1	1
0.0221		1	1	1	1	1	1
0.044		1	1	1	1	0.857	1
0.083		1	1	0.857	0.857	1	0.857
0.179		1	1	1	1	1	1
0.35		0.857	1	1	1	0.857	1
0.7		1	1	1	1	1	1
1.41		1	1	1	0.857	0.857	0.857